

Weapons Activities

Proposed Appropriation Language

For Department of Energy expenses, including the purchase, construction and acquisition of plant and capital equipment and other incidental expenses necessary for atomic energy defense weapons activities in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion; and the purchase of passenger motor vehicles (not to exceed [three] 12 for replacement only), [\$4,443,939,000] \$4,594,000,000, to remain available until expended: [*Provided*, That funding for any ballistic missile defense program undertaken by the Department of Energy for the Department of Defense shall be provided by the Department of Defense according to procedures established for Work for Others by the Department of Energy]. (*Energy and Water Development Appropriations Act, 2000.*)

Explanation of Change

Changes in the appropriation language include the number of vehicles required and deletion of language pertaining to the ballistic missile defense program which does not need to be repeated annually.

Weapons Activities

Executive Budget Summary

Vision

Possess a safe, secure, and reliable nuclear weapon stockpile meeting military requirements capable of countering the threats of the 21st century. Have the best people with the right equipment and facilities, developing knowledge, tools, and technologies for the nuclear weapon stockpile.

Mission

The mission of Defense Programs is to further strengthen U. S. national security and reduce the global danger from weapons of mass destruction.

Goals and Objectives

- # Maintain and refurbish nuclear weapons in accordance with directed schedules to sustain confidence in their safety and reliability indefinitely under the nuclear testing moratorium and arms reduction treaties.
- # Achieve a robust and vital scientific, engineering and manufacturing capability to enable the future certification of the enduring stockpile and the manufacture nuclear weapon components under the nuclear testing moratorium.
- # Ensure the vitality and readiness of DOE's nuclear security enterprise

Strategy

Our strategies to accomplish these goals and objectives are:

- # Rely on scientific understanding and expert judgement, rather than on nuclear testing and the development of new weapons, to predict, identify and correct problems affecting the safety, reliability or performance of the enduring stockpile.
- # Carry out assessment and certification activities, analyzing and evaluating the effects of changes on warhead safety and performance.
- # Develop enhanced surveillance capabilities for predicting and detecting problems.
- # Institute science-based manufacturing using advanced design and manufacturing technologies to ensure that stockpiled warheads can be refurbished and to certify new replacement parts, materials and processes.
- # Retire and dismantle weapons as needed to meet arms control objectives.
- # As new tools are developed and validated, incorporate them into a smaller, environmentally-sound, more flexible and agile weapons complex infrastructure for the future.

Program activities are focused on directed stockpile work for maintenance and refurbishment of weapons in the stockpile, on campaigns with specific technical deliverables, and on the technical base and facilities

needed to maintain a prescribed level of readiness, capability and capacity for the weapons complex in the present and for the future.

Policy Framework

In the early 1990's, as part of its continuing world leadership role in the arms control arena, the U.S. halted production of new nuclear warheads and conducted its last nuclear explosive test. Thus ended an era in which the U.S. modernized its nuclear weapon stockpile by continually replacing aging systems with new systems and in which nuclear testing served as the ultimate arbiter of the safety, reliability, and performance of the Nation's nuclear weapon stockpile. With the decision to cease production of new nuclear warheads and end nuclear testing, the Nation faced the challenge of maintaining its existing nuclear weapon stockpile with other tools for the foreseeable future. In 1993 and 1994, the President and the Congress directed the Secretary of Energy to establish a stockpile stewardship program to ensure the preservation of the core intellectual and technical competencies of the United States in nuclear weapons.

In September 1994, the President approved the Nuclear Posture Review, which established requirements for the Department of Energy related to maintaining nuclear weapons infrastructure and capabilities, and ensuring tritium availability. The requirements for DOE were stated in terms of "infrastructure to support U.S. nuclear forces," delineated specifically as follows: maintain nuclear weapon capability (without underground nuclear testing); develop a stockpile surveillance engineering base; demonstrate the capability to design, fabricate and certify weapon types in the enduring stockpile; maintain the capability to design, fabricate, and certify new warheads; and ensure tritium availability. No production of new-design nuclear warheads is required. To meet these requirements, the Department of Energy developed the Stockpile Stewardship and Management Program. The strategies and key components of this approach were articulated initially in the May 1995 DOE report, *The Stockpile Stewardship and Management Program: Maintaining Confidence in the Safety and Reliability of the Enduring U.S. Nuclear Weapon Stockpile*.

In August 1995, the President announced that the United States would pursue a zero yield Comprehensive Test Ban Treaty (CTBT) as a means of reducing the danger posed by nuclear weapons proliferation. In September 1996, the United Nations General Assembly voted nearly unanimously to endorse the CTBT negotiated at the Geneva-based Conference on Disarmament. President Clinton signed the treaty on September 24, 1996, and submitted it to the Senate for ratification. One of the six safeguards that defined the United States' policy of not conducting nuclear tests was the implementation of a stockpile stewardship program to ensure the safety and reliability of the weapons remaining in the nation's nuclear stockpile. In addition, we proposed a rigorous annual certification process to certify that the stockpile is safe and reliable in the absence of underground nuclear testing, and to produce a statement about future confidence in the safety and reliability of the stockpile.

In January 1996, the Senate gave overwhelming approval to the START II Treaty. The U.S. Senate's treaty ratification text highlighted the Nation's commitment to proceed with a robust stockpile stewardship program, to reestablish and maintain sufficient production capabilities and capacities, to maintain the U.S. nuclear weapons laboratories and the core competencies therein, to ensure rapid access to a new production source for tritium within the next decade, and to maintain the Nevada Test Site at a level which would enable timely resumption of underground nuclear testing if directed by the President.

In April 1996, the Secretary of Energy submitted to the Congress the first Stockpile Stewardship and Management Plan. The Plan was a roadmap of program activities needed to accomplish stockpile stewardship and management program goals. The document has been updated annually; the third update of the *Stockpile Stewardship Plan* was issued in May 1999 in support of the FY 2000 Congressional Budget Request.

The Department completed work on the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (SSM/PEIS) in late 1996. On December 19, 1996, the Secretary of Energy signed the Record of Decision, enabling the DOE to proceed to construction on several key new experimental facilities, reestablish a limited pit manufacturing capability, and begin facility downsizing in FY 1998 where needed in accordance with anticipated future workload levels.

On June 18, 1997, the President signed the implementing Presidential Decision Directive (PDD) for the Fiscal Year 1997-2002 Nuclear Weapons Stockpile Memorandum. The President has declared United States nuclear forces will maintain flexibility to both "hedge" against foreign political reversals (START I) as well as to "lead" through further reductions (START II). This strategy has been recognized in developing the programs and associated budget to meet these goals. This strategy is also supported in the Department's plans to transition the nuclear weapons complex from capacity-based to capability-based, while providing flexibility to support changing stockpile sizes.

On December 22, 1998, Secretary of Energy Bill Richardson fulfilled the Department's 1995 commitment to select by the end of 1998 between a commercial light water reactor and a linear accelerator as the primary source of tritium. He chose the use of Tennessee Valley Authority (TVA) reactors for producing tritium over construction of a new linear accelerator at Savannah River, and designated TVA's Watts Bar and Sequoyah reactors as the preferred facilities rather than paying for the completion of TVA's unfinished Bellefonte reactor. Consistent with the Department's dual track strategy for tritium production, the linear accelerator option has been designated as a backup technology. Secretary Richardson decided that Hanford's Fast Flux Test Facility should not play any role in producing tritium for the nation's stockpile and he outlined a course for deciding whether it should be restarted to serve future civilian research missions. A Record of Decision was issued on May 6, 1999.

On October 13, 1999, the Senate did not ratify the Comprehensive Test Ban Treaty. However, the President announced that the United States would continue to observe a policy of not conducting nuclear tests. On October 14, 1999, the Secretary of Energy directed a comprehensive internal review of the Stockpile Stewardship program. The "30 Day Review" was conducted by the Under Secretary of Energy and was reported on November 23, 1999. The findings stated that the Stockpile Stewardship program is on track, but many recommendations for improvement were included as well. These recommendations were instrumental in setting the priorities in the execution of the FY 2000 budget, and in formulating the FY 2001 request.

Program Overview

The DOE Stockpile Stewardship Program maintains confidence in the safety, reliability and performance of the nuclear weapons in the nation's stockpile without underground nuclear testing. The program develops and maintains the world class scientific, engineering, manufacturing and experimental capabilities needed to achieve weapons stockpile certification for the long term. It ensures the vitality of the DOE national security enterprise, including the physical and intellectual infrastructure for the three national laboratories, Lawrence Livermore National Laboratory (LLNL), Los Alamos National

Laboratory (LANL), and Sandia National Laboratories (SNL), the Nevada Test Site (NTS), and the Kansas City, Pantex and Y-12 production plants and Savannah River tritium facilities.

The program to create and maintain the U.S. nuclear weapon stockpile was relatively stable for the first 30 years of its existence. A growing network of Government-owned, contractor operated facilities provided capabilities to conduct weapons research and development, to test weapons at atmospheric and underground ranges, to produce special nuclear materials, and to manufacture and assemble weapons for the stockpile. Then, beginning in 1980, the Department of Energy Weapons Research, Development and Testing, Weapons Production and Surveillance, and Nuclear Materials Production programs were accelerated by President Reagan, culminating in the end of the Cold War in the early 1990's. At that point, the historical approach to nuclear weapon stockpile stewardship, including "weapons research, development, testing and production" activities, was fundamentally changed by the cessation of nuclear weapons production in 1990 and a moratorium on underground nuclear testing in 1992. Our new mission became "Stockpile Stewardship" of an aging stockpile.

Achieving confidence in our ability to certify, without nuclear testing, that the nuclear weapon stockpile remains safe and reliable for the long term requires capable and experienced people working on significant scientific and engineering challenges to develop and advance specialized knowledge, tools and techniques. Today's Stockpile Stewardship Program requires appropriate integration and balance of these three elements in meeting current and future mission: carrying out the directed stockpile workload as well as maintaining the program's infrastructure and developing capabilities needed in the future. To address these thrusts, Defense Programs is proposing a major change in program management strategy, and supporting planning, budgeting and organizational structures.

Major Changes in Program Planning and Budgeting

The FY 2001 budget reflects an integrated Stockpile Stewardship Program, built upon three elements: Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities. Overall, these changes reflect our vision for the future of the program and the nuclear weapons complex.

Directed Stockpile Work encompasses all activities that directly support specific weapons in the nuclear stockpile as directed by the Nuclear Weapon Stockpile Plan. These activities include current maintenance and day-to-day care of the stockpile as well as planned refurbishments as outlined by the Stockpile Life Extension Program (SLEP). Additionally, this category includes research, development and certification activities in direct support of each weapon system, and long-term future-oriented research and development to solve either current or projected stockpile problems. These activities are conducted at the laboratories, NTS, and production plants.

Campaigns are focused scientific and technical efforts to develop and maintain critical capabilities needed to enable continued certification of the stockpile for the long term. Campaigns are technically challenging, multi-function efforts that have definitive milestones, specific work plans, and specific end dates. The approach was initiated several years ago in the planning and execution of several new DP programs, including the Accelerated Strategic Computing Initiative, the Enhanced Surveillance Program, and the Advanced Design and Production Technologies Program. There are currently 17 planned campaigns, which are discussed in detail in the appendix to this section. These activities are conducted at the laboratories, NTS, production plants, and other major research facilities such as the OMEGA laser at the University of Rochester and the NIKE laser at the Naval Research laboratory.

Readiness in Technical Base and Facilities provides the physical infrastructure and operational readiness required to conduct the directed stockpile work and campaign activities at the laboratories, NTS and the plants. This includes ensuring that facilities are operational, safe, secure, compliant, and that a defined level of readiness is sustained at DP-funded facilities. For the production plants, all site overhead is also included in RTBF.

The FY 2001 budget request is presented in the proposed budget and reporting (B&R) structure. Control level crosswalks are provided to the old structure in Appendix I to this summary. We are still heavily involved in working the program and financial aspects of this proposed change, and realize that making an accounting system change is a major undertaking for both the Federal systems and those at our M&O contractors, and as such, we will take no action capriciously. We are continuing to execute the FY 2000 budget in the old structure, as it was appropriated; however, we are also collecting data unofficially in the new structure as a further check on the viability of the approach.

FY 2001 Congressional Request

The FY 2001 Congressional Budget request for Defense Programs is \$4.594 billion, a 6.3 percent increase over the comparable FY 2000 level. (Due to mission transfers out of the Weapons Activities account, this \$4.6 billion request is roughly comparable to a program level of about \$4.7 billion, relative to the \$4.5 billion annual funding goal discussed in previous budgets.) As part of the FY 2001 budget process, the Administration is supporting supplemental funding for FY 2000 in the amount of \$55 million to address shortfalls in production readiness at the Y-12, Kansas City and Pantex plants. Provision of this supplemental funding is essential to maintain employment levels and skills necessary to support workload in FY 2000 and future years.

Table 1
Weapons Activities Account Summary
(dollars in thousands)

	FY 1999 Current Appropriation	FY 2000 Current Appropriation	FY 2000 Comparable Appropriation	FY 2001 Request	Comparable Change %
Operations and Maintenance..	3,899,601	3,904,464	3,798,654	4,179,827	10.0%
FY 2000 Supplemental	0	55,000	55,000	0	-100.0%
PY Work conducted in FY99	28,558	0	0	0	0.0%
Subtotal O&M	3,928,159	3,959,464	3,853,654	4,179,827	8.5%
Construction	518,984	530,256	530,256	414,173	-21.9%
Subtotal, Weapons Activities	4,447,143	4,489,720	4,383,910	4,594,000	4.8%
Use of PY Balances	-50,994	-7,668	-7,668	0	-100.0%
Less Proposed Supplemental	0	-55,000	-55,000	0	-100.0%
Total, Weapons Activities . . .	4,396,149	4,427,052	4,321,242	4,594,000	6.3%

As shown in Table 1, the FY 2001 Operations and Maintenance (O&M) request increases 8.5 percent above the comparable FY 2000 appropriated level, including the pending supplemental request. The supplemental request is a result of recommendations in the 30 Day Review which highlighted FY 2000 budget pressures caused by increased security requirements and newly discovered stockpile issues. The \$55 million would provide additional funding to address critical skills retention and other issues at the Y-12, Kansas City and Pantex Plants, and would continue activities necessary to restart enriched uranium operations at Y-12.

The construction request is about 22 percent below the FY 2000 request level, reflecting programmed decreases in appropriations for major projects, including the National Ignition Facility (NIF) and the Dual Axis Radiographic Hydrodynamic Testing Facility (DARHT), and completion of funding for 6 projects. The request level supports a continuing program of infrastructure renewal at the laboratories, as well as the start of construction for three key new experimental and manufacturing facilities. Application of FY 2000 Adjustments and Rescissions by decision unit are displayed Table 7.

Table 2
Decision Unit Summary
(dollars in millions)

	FY 1999 Current Appropriation	FY 2000 Current Appropriation	FY 2000 Comparable Appropriation	FY 2001 Congressional Request	Comparable Change
Stockpile Stewardship	2,113.1	2,200.6	0.0	0.0	0.0%
Stockpile Management	2,055.4	1,991.8 ^a	0.0	0.0	0.0%
PY Work conducted in FY99	28.6	0.0	0.0	0.0	0.0%
Stockpile Stewardship O&M					
Directed Stockpile Work	0.0	0.0	760.0	836.6	10.1%
Campaigns	0.0	0.0	928.6	1,049.9	13.1%
Readiness in Technical Base	0.0	0.0	1,870.0	1,953.6	4.5%
Subtotal, Stewardship O&M	0.0	0.0	3,558.6	3,840.1	7.9%
Secure Transportation Asset	0.0	91.5	91.5	115.7	26.5%
Program Direction	250.0	205.8	203.6	224.1	10.1%
Construction	0.0	0.0	530.3	414.2	-21.9%
Subtotal	4,447.1	4,489.7	4,383.9	4,594.0	4.8%
Use of PY Balances	-51.0	-7.7	-7.7	0.0	-100.0%
Less Proposed Supplemental	0.0	-55.0	-55.0	0.0	-100.0%
Total, Weapons Activities	4,396.1	4,427.0	4,321.2	4,594.0	6.3%
Federal Staffing	1,777	1,751	1,751	1,787	2.1%

^a Includes \$55 million proposed supplemental funding.

	FY 1999 Current Appropriation	FY 2000 Current Appropriation	FY 2000 Comparable Appropriation	FY 2001 Congressional Request	Comparable Change
DP-Funded M&O ^a	22,739	21,582	22,625	22,570	-0.2%

The FY 2001 budget request supports the transition to performance-based program management and budgeting for the Stockpile Stewardship Program. The overall increase in FY 2001 will cover inflationary increases, support current infrastructure, and does not anticipate involuntary layoffs at the laboratories, Nevada Test Site (NTS) or production plants at this time. We have protected our highest priority work associated with pit aging issues, surety improvements, and stockpile support activities.

Stewardship O&M provides funding for activities carried out by integrated contractors encompassing Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities, principally at the Lawrence Livermore, Los Alamos and Sandia National Laboratories, production facilities at Kansas City, Pantex, Savannah River and Y-12, and the Nevada Test Site.

The program activities link directly with DP's performance goals and objectives in the Strategic Plan. They provide the technical basis for confidence in the safety, reliability, and performance of the U.S. weapons stockpile in the absence of underground nuclear testing. The programs have been balanced to develop and maintain essential scientific and technical capabilities over the long term while meeting near term workload requirements and schedules, within a modern integrated complex with unique and interdependent facilities.

On a comparable basis, the FY 2001 request for Stewardship O&M activities is approximately 7.9 percent above the FY 2000 request, including the pending FY 2000 supplemental.

Directed Stockpile Workload increases 10.1 percent in FY 2001. Although we will be working with the DoD to relax certain outyear schedules, critical near term stockpile needs are supported. Limited full scale engineering development continues in support of the W80 and W76, although we are interested in exploring less complex, lower cost workload options with the DoD. We have slowed efforts to transfer the work on the W80 from Los Alamos National Laboratory (LANL) to Lawrence Livermore National Laboratory (LLNL), which is a longer term workload leveling measure. Pit manufacturing and certification efforts for the W88 continue.

In the **Campaigns** to increase scientific and technical knowledge required for weapon certification, the budget request allocates significant program growth over FY 2000 to the highest priorities, supporting campaign activities and key milestones in Pit Manufacturing Readiness (+54% growth), Primary Certification (+41%), Enhanced Surveillance (+21%) and ICF and High Yield (+21%). Program growth in the 10% to 20% range is allocated in the Secondary Certification, Advanced Radiography, and Certification in Hostile Environments campaigns. We are maintaining progress on achieving an assured source of tritium, although we are suspending the efforts on the preliminary design for the backup Accelerator Production of Tritium plant. We are developing new stewardship tools, particularly simulation and modeling, DARHT, advanced burn codes, and subcritical experiments. These activities are essential to maintain confidence in the safety of the stockpile without underground nuclear testing to

^a FY 1999 End of Year; FY 2000 and FY 2001 projections are averages for labs and headcounts for plants.

assure that the U.S. will continue to certify the effectiveness of the nuclear weapon stockpile into the future.

In **Readiness in Technical Base and Facilities**, the largest category supporting operations of facilities is essentially flat from the FY 2000 level. There is significant growth over FY 2000 allocated for Containers, Advanced Simulation and Computing, and Program Readiness. DP's funding associated with the government's High Performance Computing and Communications initiative is included here.

The Department's **Secure Transportation Asset** is requesting a major funding increase to support its plan to continue to redress security and other vulnerabilities identified in recent Departmental evaluations.

Construction includes all DP-funded, line item infrastructure and programmatic construction projects at the laboratories, Nevada Test Site, and plants. The construction request is about 22 percent below the FY 2000 level. This reduction reflects the completion of appropriations for six projects, and planned decreases for three more, including the NIF and DARHT experimental facilities that are progressing towards completion. Three new starts are also proposed: the Distributed Information Systems Lab, SNL/CA; Highly Enriched Uranium (HEU) Storage Facility at Y-12; and Weapon Evaluation Testing Laboratory (WETL) at Pantex; and in addition, Defense Programs is piloting the Departmental initiative to request "Preliminary Project Design and Engineering" funding for potential outyear new construction starts. This pilot project is intended to remedy problems in construction projects related to inadequate scope definition and premature cost estimates.

The National Ignition Facility (NIF) project at Lawrence Livermore National Laboratory has made significant changes in its execution plan to address technical issues in assembling and installing laser and target system infrastructure. A new project baseline will be submitted to the Congress by June 1, 2000. DOE plans to accommodate additional FY 2001 funding needs for the NIF which result from the new baseline or related activities, if any, within the budgets for DOE Defense Programs and the Lawrence Livermore National Laboratory.

Defense Programs is requesting an increase in **Program Direction** funding of \$20.5 million, a 10.1 percent increase over the FY 2000 appropriation. The largest portion of this increase, \$11.0 million, is to cover the DP federal staff's salaries and benefits. This increase covers expected cost of living increases, step increases, promotions, and full year funding for the 30 critical new hires to be brought on-board at Headquarters as part of the Secretary's Workforce 21 initiative in FY 2000. The request supports the Secretarial Scientific Retention and Recruiting initiative to enhance scientific and technical talent in the Federal workforce, and provides flexibility to relocate staff and consolidate functions among Headquarters, operations office and area offices in FY 2001.

Table 3
Crosswalk to New Structure

(dollars in thousands)

	FY 1999 Current Approp	FY 2000 Current Approp	FY 2001 Congressional Request
Stewardship O&M			
Directed Stockpile Work			
Stockpile Stewardship	204,535	236,063	0
Stockpile Management	517,023	523,914	0
Subtotal, Directed Stockpile Work	721,558	759,977	836,603
Campaigns			
Stockpile Stewardship	632,579	613,379	0
Stockpile Management	366,994	315,219	0
Subtotal, Campaigns	999,573	928,598	1,049,907
Readiness in Technical Base and Facilities			
Stockpile Stewardship	884,642	975,895	0
Stockpile Management	889,586	894,093	0
Program Direction	10,000	0	0
Subtotal, Readiness in Technical Base and Facilities	1,784,228	1,869,988	1,953,573
TOTAL, Stewardship O&M	3,505,359	3,558,563	3,840,083
Secure Transportation Asset			
Stockpile Management	65,000	0	0
Program Direction	26,391	0	0
Transportation Safeguards Division	0	91,463	0
Total, Secure Transportation Asset	91,391	91,463	115,673
Program Direction			
Stockpile Management	9,600	0	0
Program Direction	211,456	203,628	0
Total, Program Direction	221,056	203,628	224,071

Construction

	FY 1999 Current Approp	FY 2000 Current Approp	FY 2001 Congressional Request
Stockpile Stewardship	391,326	375,309	0
Stockpile Management	127,658	154,947	0
Total, Construction	518,984	530,256	414,173
Subtotal, Weapons Activities	4,336,790	4,383,910	4,594,000
<i>Transfers</i>			
<i>Radiological/Nuclear Accident Response</i>	78,353	73,932	0
<i>Materials Surveillance</i>	32,000	31,878	0
Total, Transfers	110,353	105,810	0
Use of PY Balances	(50,994)	(7,668)	0
Use of Proposed Supplemental	0	(55,000)	0
Total Weapons Activities	4,396,149	4,427,052	4,594,000

Table 4
Federal Staffing Estimates

	FY 1999	FY 2000	FY 2001
Albuquerque Operations Office	798	744	744
Nevada Operations Office	249	237	237
Oakland Operations Office	79	83	89
Oak Ridge Operations Office	63	59	59
Savannah River Operations Office	31	29	29
Headquarters	259	276	276
Secure Transportation Asset	298	323	353
Total Weapons Federal Staffing	1,777	1,751	1,787

These levels represent expected end-of year on board staffing, adjusted for the transfers of Radiological/Nuclear Accident Response activities to another program office. Federal personnel associated with the Secure Transportation Asset are funded in the new Secure Transportation Asset decision unit, rather than from Program Direction as in prior years consistent with the FY 2000 appropriation.

Use of Prior Year Balances

Actual costs for Defense Programs in FY 1999 were 100.4 percent of our overall projections. Uncosted balances at the end of FY 1999 were 10.7 percent of the total available to cost, below the DOE and GAO thresholds, and \$16.5 million below our projection (about 4 percent). Overall, uncosted balances declined by about 3 percent from the end of FY 1998 to the end of FY 1999.

Use of \$7.7 million in prior year balances was directed as part of the FY 2000 appropriation. Of this amount, \$6.8 million was redeployed from Stockpile Management construction projects, \$387 thousand from Stewardship construction, and \$347 thousand from Stewardship Operations and Maintenance (O&M), and \$164 thousand from Stockpile Management O&M. (See Table 8)

Table 5
Site Funding Estimates

	(dollars in millions)				
	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Albuquerque Operations Office					
Albuquerque Operations Office	254.1	244.0	236.8	-7.2	-3.0%
Kansas City Plant	294.4	295.8	324.7	28.9	9.8%
Los Alamos National Laboratory	834.0	855.0	934.7	79.7	9.3%
Pantex Plant	246.7	248.9	259.2	10.3	4.1%
Sandia National Laboratories	750.1	723.4	749.8	26.4	3.7%
Subtotal, Albuquerque Ops Office	2,379.4	2,367.0	2,505.1	138.1	5.8%
Chicago Operations Office	27.3	12.7	40.6	27.9	219.7%
Idaho Operations Office	6.2	1.5	0.0	-1.5	-100.0%
Nevada Operations Office	238.2	219.9	225.9	6.0	2.7%
Oak Ridge Operations Office					
Oak Ridge Y-12	406.9	397.1	437.0	39.9	10.1%
OR Science & Technology Institute	0.1	0.2	0.2	0.0	0.0%
Oak Ridge National Laboratory	19.6	18.2	19.7	1.5	8.5%
Oak Ridge Operations Office	12.2	11.6	13.3	1.7	14.3%
Subtotal, Oak Ridge Operations Office	438.8	427.1	470.2	43.2	10.1%
Oakland Operations Office					
General Atomics	9.5	7.9	7.4	-0.5	-6.6%

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Lawrence Berkeley Laboratory	19.0	24.7	0.0	-24.7	-100.0%
Lawrence Livermore National	753.8	745.6	620.9	-124.7	-16.7%
Naval Research Laboratory	16.8	14.5	9.8	-4.8	-32.8%
Oakland Operations Office	18.7	17.9	23.6	5.7	31.9%
University of Rochester	28.9	30.8	32.2	1.3	4.3%
Subtotal, Oakland Operations Office	846.6	841.4	693.8	-147.6	-17.5%
Richland Operations Office					
Pacific Northwest Laboratory	24.0	23.7	9.7	-14.0	-59.2%
Richland Operations Office	0.1	0.0	0.0	0.0	0.0%
Subtotal, Richland Operations Office	24.1	23.7	9.7	-14.0	-59.2%
Savannah River Operations Office					
Savannah River Operations Office	3.1	3.3	3.4	0.1	2.0%
Savannah River Westinghouse	161.2	169.7	221.6	52.0	30.6%
Subtotal, Savannah River Ops Office	164.3	173.0	225.0	52.0	30.1%
Headquarters ^a	183.3	317.6	423.6	106.0	33.4%
PY work conducted in FY99	28.6	0.0	0.0	0.0	0.0%
Total, Weapons Activities	4,336.8	4,383.9	4,594.0	210.1	4.8%

Site descriptions are included in the Stewardship O&M discussion.

^a See Table 6 for funding breakout.

Table 6
Headquarters Funding Estimates
(\$ in Millions)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Headquarters					
HQ Program Direction	59.5	57.3	61.2	3.9	6.8%
Scientific Retention and Recruitment ..	0.0	0.0	3.6	3.6	100.0%
ASCI Platforms at laboratories	82.8	102.4	112.8	10.4	10.2%
ASCI University Alliances	13.3	28.4	30.8	2.3	8.1%
ASCI DISCOM2 and VIEWS	1.0	9.8	99.4	89.6	914.3%
ASCI Pathforward	17.8	18.6	25.0	6.4	34.4%
ASCI Other	3.3	6.8	4.7	-2.1	-30.9%
Pit Readiness	0.0	0.0	11.0	11.0	100.0%
Use Control Studies	1.2	2.0	15.0	13.0	650.0%
Tritium	2.3	12.2	7.9	-4.3	-35.2%
AVLIS	0.0	0.0	1.1	1.1	100.0%
Other	2.1	80.1	51.1	-29.0	-36.2%
Total, Headquarters	183.3	317.6	423.6	105.9	33.3%

Table 6 is included to explain the large amount of funding currently allocated to Headquarters. This funding comprises two main types of activities: funding for activities where site decisions have yet to be made, and "pass through" funding for the M&O sites. The "pass through" funding is budgeted for the Advanced Simulation and Computing component of RTBF, and reflects the cost of hardware acquisition, alliances with academia, and partnerships with U. S. industry. The large growth in FY 2001 is primarily associated with the start-up funding for two ASCI efforts – VIEWS and DISCOM2 -- which are discussed in the RTBF justification that follows.

Table 7
Detailed Program Funding Summary
(Comparable)
(\$ in Thousands)

	FY 1999 Current Approp	FY 2000 Current Approp	FY 2001 Request	\$ Change	% Change
Stewardship O&M					
Directed Stockpile Work					
Stockpile R&D	204,535	236,063	243,300	7,237	3.1%
Stockpile Maintenance	228,367	240,745	257,994	17,249	7.2%
Stockpile Evaluation	118,842	118,140	151,710	33,570	28.4%
Dismantlement/Disposal	29,767	29,111	29,260	149	0.5%
Production Support	136,047	131,830	149,939	18,109	13.7%
Field Engineering, Training & Manuals ..	4,000	4,088	4,400	312	7.6%
Subtotal, DSW	721,558	759,977	836,603	76,626	10.1%
Campaigns					
Primary Certification	41,996	29,468	41,400	11,932	40.5%
Dynamic Materials Properties	68,206	62,386	64,408	2,022	3.2%
Advanced Radiography	27,122	37,855	43,000	5,145	13.6%
Sec Certif & Nuclear Systems Margins ...	45,520	44,375	52,964	8,589	19.4%
Enhanced Surety	47,556	38,276	40,600	2,324	6.1%
Weapons System Engineering Certif.	23,900	14,924	16,300	1,376	9.2%
Certification in Hostile Environments	16,399	13,751	15,400	1,649	12.0%
Enhanced Surveillance	82,877	74,042	89,651	15,609	21.1%
Adv. Design & Production Technologies ..	109,630	76,393	75,735	(658)	-0.9%
ICF Ignition & High Yield	97,624	99,737	120,800	21,063	21.1%
Defense Applications & Modeling	183,162	227,732	249,100	21,368	9.4%
Pit Manufacturing Readiness	75,881	69,969	108,038	38,069	54.4%
Secondary Readiness	0	0	15,000	15,000	100.0%
High Explosives Readiness	0	0	0	0	0.0%
Nonnuclear Readiness	800	0	0	0	0.0%

	FY 1999 Current Approp	FY 2000 Current Approp	FY 2001 Request	\$ Change	% Change
Materials Readiness	37,900	39,088	40,511	1,423	3.6%
Tritium Readiness	141,000	100,602	77,000	(23,602)	-23.5%
Total, Campaigns	999,573	928,598	1,049,907	121,309	13.1%
Readiness in Technical Base & Facilities					
Operations of Facilities	1,315,537	1,320,478	1,313,432	(7,046)	-0.5%
Program Readiness	92,063	62,509	75,800	13,291	21.3%
Special Projects	24,711	50,817	48,297	(2,520)	-5.0%
Material Recycle and Recovery	17,410	18,649	22,018	3,369	18.1%
Containers	14,127	4,833	7,876	3,043	63.0%
Storage	19,816	15,627	9,075	(6,552)	-41.9%
Advanced Simulation & Computing	300,564	397,075	477,075	80,000	20.1%
Total, Readiness in Technical Base & Facilities	1,784,228	1,869,988	1,953,573	83,585	4.5%
Total, Stewardship O&M	3,505,359	3,558,563	3,840,083	281,520	7.9%
Secure Transportation Asset					
Program	65,000	59,772	79,357	19,585	32.8%
Program Direction	26,391	31,691	36,316	4,625	14.6%
Total, Secure Transportation Asset	91,391	91,463	115,673	24,210	26.5%
Total, Program Direction	221,056	203,628	224,071	20,443	10.0%
Total, Construction	518,984	530,256	414,173	(116,083)	-21.9%
Subtotal, Weapons Activities	4,336,790	4,383,910	4,594,000	210,090	4.8%
Use of prior year balances	(50,994)	(7,668)	0	7,668	-100.0%
Proposed Supplemental	0	(55,000)	0	55,000	-100.0%
Total, Weapons Activities	4,285,796	4,321,242	4,594,000	272,758	6.3%

Table 8
Application of Funding Adjustments
by Congressional Control Level
FY 1999 and FY 2000
(Non-comparable)
(\$ in Thousands)

	FY 1999 Prior Year Balances	FY 2000 Prior Year Balances	Contractor Travel Savings	Directed Savings	General Reduction	FY 2000 Rescission
Stockpile Stewardship						
Core Stewardship	(392)	(12)	(21,794)	(2,970)	(11,700)	(5,981)
Inertial Confinement Fusion	0	(147)	(414)	0	0	(863)
Technology Partnerships	(16)	(179)	0	0	(1,878)	(47)
Education	0	(9)	0	0	0	(71)
Construction	(6,951)	(387)		0	(2,500)	(1,431)
Subtotal, Stewardship	(7,359)	(734)	(22,208)	(2,970)	(16,078)	(8,393)
Stockpile Management						
O&M	(10,474)	(164)	(7,792)	(2,030)	(6,177)	(6,778)
Construction	0	(6,770)	0	0	(5,150)	(582)
Subtotal, Management	(10,474)	(6,934)	(7,792)	(2,030)	(11,327)	(7,360)
Secure Transportation Asset	0	0	0	0	0	(349)
Program Direction	(4,603)	0	0	0	(2,395)	(785)
Subtotal	(22,436)	(7,668)	(30,000)	(5,000)	(29,800)	(16,887)
Stockpile Management - PY work conducted in FY 1999	(28,558)	0	0	0	0	0
TOTAL	(50,994)	(7,668)	(30,000)	(5,000)	(29,800)	(16,887)

Program Performance Measures

The Strategic Objectives, Strategies and Performance Measures in development for the current update of the Department of Energy Strategic Plan are the basis for this budget request. The following three nuclear stewardship strategic objectives will be accomplished as a result of carrying out the supporting activities detailed in this budget justification.

- NS-1 Maintain and refurbish nuclear weapons in accordance with directed schedules to sustain confidence in their safety and reliability indefinitely under the nuclear testing moratorium and arms reduction treaties.
- NS-2 Achieve a robust and vital scientific, engineering and manufacturing capability to enable the future certification of the enduring stockpile and the manufacture of nuclear weapon components under the nuclear testing moratorium.
- NS-3 Ensure the vitality and readiness of DOE's nuclear security enterprise.

The FY 2001 Performance Plan and the FY 2000 Performance Agreement with the Secretary are highlighted later in this document. Also included is the final report on the FY 1999 Performance Agreement.

BG Thomas Gioconda, USAF
Acting Assistant Secretary
for Defense Programs

Date

Defense Programs FY 2001 Performance Plan

FY 2001 Performance Measure
<p>Report annually to the President on the need or lack of need to resume underground nuclear testing to certify the safety and reliability of the nuclear weapon stockpile.</p> <p>Meet all annual weapons maintenance and refurbishment schedules developed jointly by DOE and DoD.</p> <p>Meet annual schedules for the safe and secure dismantlement of nuclear warheads that have been removed from the U.S. nuclear weapon stockpile.</p> <p>Provide scientific understanding of the nuclear package of weapon systems to sustain our ability to certify the nuclear weapon stockpile without underground nuclear testing.</p> <p>Develop the simulation and modeling tools and capabilities to implement virtual testing of nuclear weapons and components in the absence of underground nuclear testing.</p> <p>Provide specific tools, capabilities and components necessary to sustain the viability of the manufacturing base within the nuclear weapons complex, including a reliable source of tritium by 2006.</p> <p>Ensure the physical infrastructure and facilities are operational, safe, secure and compliant and that a defined state of readiness is sustained at all needed facilities.</p> <p>Maintain the DOE Secure Transportation Asset for the safe and secure transport of nuclear weapons, special nuclear material and weapon components.</p> <p>Ensure that the capability to resume underground testing is maintained in accordance with the Presidential Decision Directive through a combined experimental and test readiness program.</p> <p>Ensure the availability of a workforce with the critical skills necessary to meet long term mission requirements.</p>

Defense Programs FY 2000 Performance Agreement

FY 2000 Performance Measure
<p>Meet all annual weapons alteration and modification schedules developed jointly by DOE and DoD.</p> <p>Report annually to the President on the need or lack of need to resume underground nuclear testing to certify the safety and reliability of the nuclear weapon stockpile.</p> <p>Complete an internal comprehensive review of the Stockpile Stewardship Program.</p> <p>Begin implementation of the selected technology to provide a reliable source of tritium.</p> <p>Demonstrate a computer code capable of performing a three dimensional analysis of the dynamic behavior of a nuclear weapon, including a prediction of the total explosive yield, on an ASCI computer system.</p> <p>Continue construction of the National Ignition Facility (NIF) and rebaseline its future construction, total costs and schedules by June 2000.</p> <p>Conduct future subsets of the subcritical experiments begun in FY 1999 and one additional subcritical experiment at the Nevada Test Site to provide valuable scientific information about the behavior of nuclear materials during the implosion phase of a nuclear weapon</p> <p>Ensure that all facilities required for successful achievement of the Stockpile Stewardship Plan remain operational.</p> <p>Meet the established schedules for downsizing and modernizing our production facilities.</p> <p>Ensure that the capability to resume underground testing is maintained in accordance with the Presidential Decision Directive through a combined experimental and test readiness program.</p> <p>Adhere to approved schedules for the safe and secure dismantlement of weapons that have been removed from the U.S. nuclear weapon stockpile.</p>

Defense Programs FY 1999 Performance Agreement

FY 1999 Performance Measure	Final Status
Report annually to the President on the need or lack of need to resume underground nuclear testing to certify the safety and reliability of the nuclear weapon stockpile.	Met Goal
Meeting all annual weapons alteration and modification schedules developed jointly by DOE and DoD.	Nearly Met Goal
Continued development of the dual-path options and select, by December 1998, a primary tritium production technology.	Met Goal
Demonstrated a 3-trillion operations per second computer system	Exceeded Goal
Continue construction of the National Ignition Facility (NIF) according to its Project execution Plan schedules.	Below Expectation
Conduct two to three subcritical experiments to provide information about the behavior of nuclear materials during the implosion phase of a nuclear weapon	Met Goal
Ensure that all facilities required for successful achievement of the Stockpile Stewardship Plan remain operational.	Below Expectation
Meet the established schedules for downsizing and modernizing our production facilities.	Nearly Met Goal
Ensure that the capability to resume underground testing is maintained in accordance with the Presidential Decision Directive and Safeguard C of the CTBT.	Met Goal
Maintain robust emergency response assets in accordance with Presidential Decision Directive 39, the Atomic Energy Act and Executive Order 12656 and Federal Emergency Plans.	Met Goal
Adhere to schedules for the safe and secure dismantlement of nuclear warheads that have been removed from the U.S. nuclear weapon stockpile.	Below Expectation

Final FY 1999 Performance Report - Defense Programs

Report annually to the President on the need or lack of need to resume underground testing to certify the safety and reliability of the nuclear weapons stockpile.

Assessment: Met Goal

Status: The establishment of an annual process for the review and certification of the safety and reliability of the nuclear weapons stockpile was directed by President Clinton and is crucial to this Nation's pursuit of the Comprehensive Test Ban Treaty. The Secretaries of Defense and Energy must inform the President each year whether the nuclear stockpile has any safety or reliability concerns that require underground testing. In reaching their conclusion they are advised by the Directors of DOE's national weapons laboratories, the Commander of the U.S. Strategic Command, and the joint Nuclear Weapons Council. The third annual certification was completed in December 1998. The Sandia National Laboratory, the Los Alamos National Laboratory and the Lawrence Livermore National Laboratory published technical reports for the fourth annual certification in July 1999, completing the portion of the fourth annual certification cycle which is unique to DOE.

Meet all annual weapons alteration and modification schedules developed jointly by DOE and DoD.

Assessment: Nearly Met Goal

Status: While weapons in the stockpile are safe, weapon alterations and modifications are crucial to upgrade the stockpile to meet higher safety margins, replace faulty components, meet changed military requirements, or extend the life of the weapon. In Fiscal Year 1999, there was no requirement for modifications but there were eleven weapon alterations ongoing, either research and development activities or refurbishment. The alterations were for the B61 (five), B83 (two), W76 (one), W78 (one) and W87 (two). DOE met the annual schedule for nine weapon alterations. Plan Of Action: For alterations 342 (W87) and 752 (B83), recovery schedules have been developed with the DoD and DOE is meeting the new revised schedule.

Continue development of the dual-path options and select, by December 1998, a primary tritium production technology.

Assessment: Met Goal

Status: The Department met its goal by selecting a primary tritium production technology in December 1998. In order to function as designed, all U.S. nuclear weapons require the use of tritium which has not been produced by the United States since 1988. Because tritium, a radioactive isotope of hydrogen, decays at a rate of 5.5 percent per year, it must be replenished periodically. The current inventory of tritium is dwindling and will be sufficient to meet requirements only until about 2005, after which the 5-year tritium reserve would be impacted. Thus, it is necessary that a new domestic source of tritium be established by then. In December 1998, the Secretary announced his preference for producing tritium in commercial reactors. In May 1999, the Department issued a consolidated Record of Decision announcing that tritium will be produced in the Watts Bar and Sequoyah reactors operated by the Tennessee Valley Authority (TVA). The Record of Decision also stated DOE's intention to construct a new Tritium Extraction Facility at the Savannah River Site and to complete design of the Accelerator for Production of Tritium (APT) as

the backup tritium technology. At the end of FY 1999, DOE and TVA had reached an agreement in principle for irradiation services, but TVA has delayed its formal signing of the agreement until it can convene a full board of directors meeting after two new directors are confirmed by the Senate. This, in turn, will delay the initiation of the process to amend the operating licenses of TVA's reactors to permit tritium production. However, the delay is not expected to delay the start of tritium production in FY 2003. Thirty two tritium-producing rods have been irradiated in TVA's Watts Bar reactor for a full operating cycle. The rods have been taken to DOE's Argonne National Laboratory-West in Idaho where they are undergoing various non-destructive post-irradiation examinations. The Nuclear Regulatory Commission's Safety Evaluation Report on the rods cited no significant safety hazards involving their use in commercial reactors. The Department has issued a request for proposals to manufacture production-scale quantities of the rods. Detailed design and site preparation for the Tritium Extraction Facility has commenced. In June 1999, the APT Project was rebaselined to reflect its status as the backup tritium-production technology. Engineering development and demonstration of key components of the accelerator system continued as planned throughout FY 1999. Activities included integrated operation of the Low Energy Demonstration Accelerator (LEDA), development and testing of high-energy radio frequency linear accelerator technology, target/blanket performance and material studies, and tritium separation facilities. The first continuous-wave beam through integrated front-end accelerator components was achieved on July 30. Since then, testing continued at gradually increased power levels in order to demonstrate 100 milliamp continuous-wave beam operation. Los Alamos scientists successfully accomplished this critical milestone on September 17. Development of design packages for each major facility subsystem and prototype design of key elements continued throughout FY 1999. Integration of safety requirements into the design process, facility and system design descriptions and safety documentation progressed.

Demonstrate a 3-trillion operations per second computer system.

Assessment: Exceeded Goal

Status: The Accelerated Strategic Computing Initiative (ASCI) is a time-critical, essential element of the Department of Energy's Stockpile Stewardship Program. ASCI will enable DOE to develop the advanced simulation and modeling technologies necessary to shift from the past stockpile management approach based on new weapon development and nuclear testing to a science-based approach based on maintenance of the existing stockpile through advanced simulation and fundamental experiments. Specifically, ASCI will create and provide to all stewardship activities the leading-edge weapon simulation capabilities that are essential for maintaining the safety, reliability, and performance of the nation's nuclear stockpile under the current nuclear test moratorium and to the challenge set forth by the Comprehensive Test Ban Treaty. The ASCI Blue-Pacific system at the Lawrence Livermore National Laboratory is currently operating at 3.89 trillion operations per second, approximately 30% faster than our performance goal. In addition, the ASCI Red system at the Sandia National Laboratory is operating at 3.15 trillion operations per second and the ASCI Blue-Mountain system at the Los Alamos National Laboratory is operating at 3.07 trillion operations per second. These systems are being used by ASCI's code development teams and weapons designers to run weapons simulations that are larger and more complex than was possible on previous machines. These simulations include higher resolution, improved physics models, and more robust computational math.

Continue construction of the National Ignition Facility (NIF) according to its Project Execution Plan schedules.

Assessment: Below Expectation

Status: The project's progress measured against the baseline currently included in the Project Execution Plan has met expectations. There was excellent progress and cost control on conventional facilities construction, the optics vendor development program proceeded as planned and the underlying technical basis for the project remains sound. There has been rapid progress in design activities of the special laser equipment, though overall design remains behind schedule. In addition, a new laser deployment strategy was developed that better meets the needs of the Stockpile Stewardship Program and makes the facility more flexible and useful to other users as well. However, in late August it was announced that delays in completing the design of laser and support equipment, coupled with additional costs for assembly of the laser infrastructure, are projected to significantly impact project cost and schedule. During the course of FY 99, the project developed a new understanding of the stringent requirements for cleanliness and alignment of the laser system, which resulted in the need to redesign some aspects of the laser support equipment, and to replan the deployment sequence of the laser system. The method of accomplishing the construction of the lasers in the building will require involvement of architectural/engineering firms and high-technology industry that was not previously planned. This is an out-year issue that was identified by the project staff working with the Department. Plan Of Action: The Secretary has issued a six-point plan to get the project back on track, and Defense Programs management has responded with an action plan. The Secretary has directed that aggressive inquiries be made by the Department, by outside experts, and by LLNL, to determine why this problem arose, and how best to proceed in a cost-effective and expeditious manner to complete the project as close to budget and schedule as possible. An integral part of the corrective action will be a review by the Secretary of Energy Advisory Board. Although project managers are taking aggressive engineering and management steps to mitigate the cost and schedule issues associated with the laser system, the Department anticipated that resolving this issue will necessitate a baseline change at the Acquisition Executive level to accurately reflect future effort required for completing the project. Consistent with Conference Report language accompanying the FY 2000 Energy and Water Development Appropriations Act, a new project baseline will be completed in time for Secretarial approval and submittal to Congress not later than June 1, 2000.

Conduct two or three subcritical experiments at the Nevada Test Site to provide valuable scientific information about the behavior of nuclear materials during the implosion phase of a nuclear weapon.

Assessment: Met Goal

Status: Three subcritical experiments were conducted in FY 1999. On December 11, 1998, we conducted the first subcritical experiment of FY 1999, Cimarron, a Los Alamos National Laboratory (LANL) experiment. On February 9, 1999, Clarinet, a Lawrence Livermore National Laboratory (LLNL) subcritical experiment, was successfully executed. On September 30, 1999, we successfully executed Oboe 1, the first in a LLNL series of smaller subcritical experiments. The Cimarron experiment obtained data on the behavior of plutonium subjected to shock from high explosives. The Clarinet experiment obtained data on plutonium shocked with high explosives using both newly fabricated and aged samples. The Oboe series of experiments will also obtain data to improve our understanding of the complex behavior of metal surfaces under high explosive shock conditions. Data from subcritical experiments will be used to develop the science-based stewardship computer models. Additionally, the subcritical experiments make a significant contribution to maintaining nuclear test readiness, required by Safeguard C of the Comprehensive Test Ban Treaty and Presidential Decision Directive.

Ensure that all facilities required for successful achievement of the Stockpile Stewardship Plan remain operational.

Assessment: Below Expectation

Status: Two key activities are underway to provide operational production facilities for the successful implementation of the Stockpile Stewardship Plan : resumption of Enriched Uranium Operations (EUO) at the Y-12 Plant near Oak Ridge, Tennessee and the establishment of a Pit Production Program at the Los Alamos National Laboratory in New Mexico. At the Y-12 Plant , shipping/receiving, assembly/disassembly, depleted uranium operations, and evaluation of canned subassemblies were all restored by 1997. The first phase (Phase A) of the enriched uranium operations resumption process (resuming casting, rolling and forming, machining operations, partial material control and accountability functions) was completed in December 1998. The second and final phase (Phase B) of EUO resumption restores chemical recovery processing and enriched uranium metal production capabilities. EUO Phase B resumption activities are significantly behind the FY99 schedule of September 1999 for enriched uranium metal production and June 2000 for chemical recovery processing. In the effort to reestablish the pit production capabilities at Los Alamos the Chemistry and Metallurgy Research Upgrades project at Los Alamos National Laboratory (LANL) has been re-baselined, focusing resources on those upgrades necessary to ensure facility operability for the next ten years. The Department and the LANL have begun pre-conceptual planning to replace the capabilities provided by this facility. The Transition Manufacturing and Safety Equipment (TMSE) project at Los Alamos National Laboratory (LANL) will provide urgent and near-term process equipment and infrastructure necessary for fabrication and certification of a War Reserve quality pit. To date, eleven of thirty TMSE sub-projects have been individually authorized and work initiated. Development of an overall baseline for this project is approximately four months behind schedule. The Capability Maintenance and Improvement Project (CMIP) will provide infrastructure improvements necessary to support a limited pit manufacturing capability at LANL. The project is currently planned as a new start in FY 2002. Plan Of Action: The significant delays in resumption of EUO Phase B capabilities were due to inadequate design and project controls for the hydrogen fluoride supply system line item project, and inadequately estimating the material condition and resources required to accomplish the restart efforts. The schedules to complete the remaining Phase B tasks are currently under review by a new contractor management team and DOE line management. A commitment to provide a new schedule and budget for the completion of Phase B resumption by December 31, 1999 was made in a briefing to the Deputy Secretary of Energy on November 12, 1999.

Meet the established schedules for downsizing and modernizing of our production facilities.

Assessment: Nearly Met Goal

Status: Downsizing and modernization of our production facilities are planned under the Stockpile Management Restructuring Initiative (SMRI). This initiative includes the tritium facilities at the Savannah River Site near Aiken, South Carolina; uranium machining, recycling and storage facilities at the Y-12 Plant; weapons assembly/disassembly and high explosive fabrication facilities at the Pantex Plant near Amarillo, Texas; and non-nuclear production facilities for electronic, electro-optical devices, plastic and machined parts at the Kansas City Plant in Kansas City, Missouri. Construction funds for the downsizing at Savannah River and Y-12 were received in FY1998 and FY1999. Construction funds for the Kansas City and Pantex SMRI projects were received in FY1999; however, there was a Congressional requirement to have an

Independent External Assessment report delivered to the Congressional Committees before obligating any of these funds. The reports were delivered to the Committees as required, but the obligation of funds was not authorized until May 28, 1999. This was eight months after the established schedule date for the authorization. The schedules for these two projects are being reestablished for performance measurement. The Savannah River SMRI project was 7% and the Y-12 SMRI project was 9% behind the established schedules.

Ensure that the capability to resume underground testing is maintained in accordance with the Presidential Decision Directive and Safeguard C of the Comprehensive Test Ban Treaty (CTBT).

Assessment: Met Goal

Status: The Department met its goal in maintaining its capability to resume underground nuclear testing. Maintaining the capability to resume nuclear testing requires DOE to maintain: (1) test facilities and equipment at the Nevada Test Site (NTS), (2) nuclear testing skills of personnel at both the NTS and the nuclear weapons laboratories, and (3) access to experienced personnel through knowledge capture and archiving. Experiments that require large quantities of high-explosives or experiments that require special nuclear materials driven by small amounts of high-explosives, the latter referred to as subcritical experiments, are conducted at the NTS. These experiments and specially designed test readiness exercises maintain NTS personnel test readiness skills including containment, security, assembly, storage and transportation, insertion and emplacement, timing and control, arming and firing, diagnostics, and test control center activities. Three subcritical experiments, Cimarron, Clarinet, and Oboe 1, and 19 high-explosive experiments were conducted in FY 99, as well as a Nuclear Explosive Safety Study exercise which was performed with LANL. For the purpose of managing equipment and facilities essential to conducting an underground nuclear test, the DOE Nevada Operations Office has an ongoing archiving program which captures on videotape the knowledge and testing experience of departing personnel as well as data, photos, drawings, procedures, nuclear explosive safety studies, containment evaluation plans, lessons learned, and other information. In FY 1999, 7 video tape modules were completed; 3 new CD ROMs were created; and over 41,000 pages related to underground tests were scanned into the Document Management and Archived Records System. Additionally, many milestones toward implementing a computer aided management decision system (the Decision Support System (DSS)) were achieved: the Compliance Requirements database was linked to the DSS to identify requirements of UGT procedures, DOE orders, laws, certifications, permits, and qualifications; dynamic models for UGT functional areas covering Control Room activities, Readiness briefings; Arming & Firing, Area Control, Test Execution, and Treaty Verification were completed; and a reporting function, making it easier to perform cost-benefit analysis was added.

Maintain robust emergency response assets in accordance with Presidential Decision Directive 39, the Atomic Energy Act and Executive Order 12656 and Federal Emergency Plans.

Assessment: Met Goal

Status: This activity was transferred to the Office of Security and Emergency Operations in August 1999.

Adhere to schedules for the safe and secure dismantlement of nuclear warheads that have been removed from the U.S. nuclear weapons stockpile.

Assessment: Below Expectation

Status: In FY 1999, 207 nuclear warheads were dismantled, significantly less than the performance goal. Dismantlement of the W69 Short-Range Attack Missile warhead was completed in FY 1999. However during FY 1999, dismantlement of the W79 Artillery-Fired Atomic Projectile warhead was at a rate lower than expected due to technical difficulties with the process and facility modifications. Dismantling of the W56 Minuteman II warhead was delayed by technical difficulties. No reliability figures or plans for military facilities have been affected.

Plan Of Action: The backlog of retired warheads yet to be dismantled will be completed in FY 2005, not FY 2003 as previously planned.

Appendix I

Defense Programs

Budget Structure Change

- 1. Chart of Accounts and Controls**
- 2. Budget Structure Definitions**
- 3. Funding Crosswalks**

**Defense Programs
Unified Budget Structure**

Congressional Control	B&R Series					UNIFIED STRUCTURE
	2	4	6	8	9	
	DP					STOCKPILE STEWARDSHIP (Weapons Activities)
						STEWARDSHIP OPERATIONS & MAINTENANCE (O&M)
						Directed Stockpile Work
						01 Stockpile Research & Development
						02 Stockpile Maintenance
						03 Stockpile Evaluation
						04 Dismantlement/Disposal
						05 Field Engineering, Training and Manuals
						06 Production Support
						Campaigns
						01 Primary Certification
						02 Dynamic Materials Properties
						03 Advanced Radiography
						04 Secondary Certification and Nuclear Systems Margins
						05 Enhanced Surety
						06 Weapon System Engineering Certification
						07 Certification in Hostile Environments
						08 Enhanced Surveillance
						09 Advanced Design & Production Technologies
						10 Inertial Confinement Fusion Ignition and High Yield
						11 Defense Applications and Modeling
						12 Pit Manufacturing Readiness
						13 Secondary Readiness
						14 HE/Assembly Readiness
						15 Nonnuclear Readiness
						16 Materials Readiness
						17 Tritium Readiness
						Readiness in Technical Base and Facilities (RTBF)
						01 Operations of Facilities
						02 Program Readiness
						03 Special Projects
						04 Material Recycle and Recovery
						05 Containers
						06 Storage
						07 Advanced Simulation and Computing
						SECURE TRANSPORTATION ASSET
						PROGRAM DIRECTION
						CONSTRUCTION
						Projects listed individually

Appropriation: *Weapons Activities*

Decision Unit: *Stewardship Operations & Maintenance*

Stewardship Operations & Maintenance consists of three components: Directed Stockpile Work (DSW), Campaigns, and Readiness in Technical Base and Facilities.

Directed Stockpile Work (DSW)

Directed Stockpile Work (DSW) encompasses all activities that directly support specific weapons in the nuclear stockpile. These activities include current maintenance and day-to-day care as well as planned refurbishments as outlined by the Stockpile Life Extension Program (SLEP). Additionally, DSW includes research, development, engineering, and certification activities in direct support of each weapon both in the present and future. DSW is executed through an integrated system of plans that utilize parts of the entire nuclear weapons complex including the Defense Programs (DP) Headquarters, National Laboratories, production complex, and other DP facilities. DSW represents a robust program that will ensure the future viability of the stockpile by maintaining a balanced effort of both near-term weapon activities and long-term future research and development. DSW is executed through several subordinate activities: Stockpile Research and Development; Stockpile Maintenance; Stockpile Evaluation; Dismantlement/Disposal; Production Support; and, Field Engineering Training, and Manuals.

Stockpile Research & Development includes the scientific understanding and engineering development capabilities necessary to support near-term and long-term requirements of the nuclear stockpile. This category includes preproduction design and engineering activities; design and development of weapon modifications; technical aspects of the laboratory surveillance and flight test program; safety studies and assessments; technical analysis needed to dismantle and safely store weapons being removed from the stockpile; and development of all new weapon designs, if needed.

Stockpile Maintenance includes limited life component exchange, maintenance, and life extension activities on various weapon types in the enduring stockpile to maintain a safe and reliable weapons stockpile.

Stockpile Evaluation includes new material laboratory tests, new material flight tests, stockpile laboratory tests, stockpile flight tests, quality evaluations, special testing, and surveillance of weapon systems to assess the safety and reliability of the nuclear weapons stockpile as a basis for the Annual Certification to the President.

Dismantlement/Disposal includes all activities including safety analysis associated with weapon retirement, disassembly, component characterization, and disposal and reclamation of materials and components; the engineering, development, testing, certification, procurement, and refurbishment of containers required for interim storage; and the staging and storage of weapons, components, and materials awaiting dismantlement.

Production Support includes quality and production supervision and control, quality assurance and production and process engineering.

Field Engineering, Training and Manuals includes costs incurred for technical training of military and contractor personnel participating in the Joint Task Group evaluations of weapons prior to complete engineering release.

Campaigns

Campaigns are technically challenging, multi-year, multi-functional efforts across the DP laboratories, the production plants, and the Nevada Test Site (NTS) which constitute an integrated weapon science and technology program designed to develop and maintain specific critical capabilities needed to achieve weapons stockpile certification confidence. The goal of these campaigns is to provide the capability to address current or future questions or issues by employing the best scientists and engineers and using the most advanced sciences and technologies. Campaigns have milestones and specific end-dates, effectively focusing research and development activities on clearly defined deliverables. Currently, there are 17 Campaigns, each of which is explained below. It is anticipated that as these campaigns achieve their end state, they will be replaced by new campaigns.

The **Primary Certification Campaign** includes experimental activities which will develop and implement the ability to certify rebuilt and aged primaries to within a stated yield level without nuclear testing. Activities include: hydrodynamic experiments, including those conducted on DARHT; subcritical experiments at the U1a complex in Nevada needed to validate simulation and modeling capabilities; other above ground experiments, including NIF experiments; and reanalysis of past underground test results. This campaign will integrate improved computational capabilities being developed under the Defense Applications and Modeling campaign and it is interdependent with the Dynamic Materials campaign. Capabilities developed under this campaign will directly support DSW, including the B61, W80, and W76 SLEPs and certification of the W88 warhead pit rebuild.

The **Dynamic Materials Properties Campaign** includes efforts to develop physics-based, experimentally-validated data and models of all stockpile materials under a broad range of dynamic conditions found in nuclear explosions. In the past, dynamic materials properties were often inferred from, and normalized to, integral test data on a descriptive and empirical basis. Without the availability of such integral tests, the materials models to be developed by this campaign are essential to establish predictive relationships between materials properties and stockpile performance, safety and reliability. This Campaign will provide materials data and models of actinide thermodynamic properties (with an emphasis on plutonium multi-phase equation of state and complete phase diagram) to directly support the W88 pit rebuild; the B61, W80, and W76 refurbishments; and additional pit surveillance. Initially, the Campaign will focus on stockpile materials with the highest leverage and greatest uncertainties, including actinides (with a strong emphasis on plutonium), surrogate metals, boost gas, high explosives, organics, and foams.

The **Advanced Radiography Campaign** will develop technologies for multi-view, time-gated images of imploding surrogate primaries, with sufficient temporal and 3-D spatial resolution to resolve uncertainties in primary performance. This work will include developing advanced multi-time, multi-view, x-ray diagnostic techniques on DARHT, and further developing and evaluating proton radiography techniques. The capabilities provided by this Campaign will enable designers to experimentally infer integral primary performance parameters. This Campaign will provide the technical requirements and demonstrate required technologies for upgrading national hydrodynamics experimental capabilities to provide the radiographic imaging needed for long-term certification of the stockpile.

The **Secondary Certification and Nuclear-Systems Margins Campaign** includes experimental and computational activities which will determine the minimum primary factors necessary to produce a militarily effective weapon. In the past, our incomplete understanding of secondary physics required underground nuclear tests to establish the performance “margins.” In the absence of underground nuclear testing, aging and remanufacturing issues require a predictive capability. The activities in this campaign will develop a validated predictive computational capability for each system in the stockpile, determine the primary radiation emission and energy flow, and determine the performance of nominal, aged, and rebuilt secondaries.

The **Enhanced Surety Campaign** includes efforts to develop enhanced surety options to provide a new level of use-denial capabilities, such that they may be considered for incorporation in scheduled stockpile refurbishments. Near term objectives include development of enhanced surety options in the B61, W80, and W76 weapon systems in time to support refurbishment schedules. It will also incorporate new computational capabilities in the component development process and support integration of microsystems components. This Campaign is needed to help meet the Department’s obligation to provide the most modern surety possible for nuclear weapons during the replacement, refurbishment, and/or upgrade of weapon components.

The **Weapon System Engineering Certification Campaign** will establish science-based engineering methods that will increase future certification confidence in weapons systems through validated simulation models and high fidelity experimental test data within a limited test program. The goal is to conduct one half the number of tests while obtaining twice as much experimental data for system engineering certification. This Campaign will develop validated engineering computational models and a suite of tools to allow for science-based certification of the B61, W80, and W76 SLEPs.

The **Certification in Hostile Environments Campaign** will develop certification tools and microelectronics technologies required, in the absence of nuclear testing, to ensure that refurbished weapons meet the Stockpile to Target Sequence (STS) hostile environments requirements. This Campaign will develop validated computational tools for certification, reevaluate nuclear weapon hostile environments, develop radiation-hardened technologies, and demonstrate certification technologies on the W76 life extension program.

The **Enhanced Surveillance Campaign** will provide a validated basis to determine if or when components must be replaced. In order to certify aged systems, Defense Programs must be able to provide life estimates of components to provide high confidence that refurbished systems can remain in the field for another 20 - 30 years. This Campaign will develop tools, techniques, and models to measure, qualify, calculate, and predict the effects of aging on weapon materials and components and to understand how these effects impact weapon safety and reliability. Weapons surveillance will be augmented with new diagnostics for early detection of potential defects. The Campaign will assess materials to minimize replacement of components for the W80, and will provide valuable information for long-term capability development, such as when new manufacturing facilities, such as pit production, will be needed.

The **Advanced Design and Production Technologies (ADAPT) Campaign** will develop capabilities to deliver qualified refurbishment products upon demand. This Campaign will develop modeling and simulation tools and information management technologies to enable full-scale engineering development with minimal hardware prototyping and totally paperless processes for the W80 and subsequent weapon refurbishment activities. This will be accomplished by developing multiple, fast turnaround engineering options through virtual prototypes and implementing modern product data management and collaboration tools.

The **Inertial Confinement Fusion (ICF) Ignition & High Yield Campaign** includes those activities needed to support the start of ignition implosions and enhance experimental capabilities for stewardship. Material conditions that can be reached on the NIF, together with the diagnostics available, will also provide enhanced experimental capability for weapon certification, and weapons-relevant materials dynamics measurements. X-ray driven and directly driven thermonuclear ignition on the NIF will provide a unique testbed for radiation-hydrodynamic codes including burn propagation and mix. Achievement of ignition will be preceded by developing the ignition targets and target diagnostics, and by experiments that verify conditions produced by the laser pulses necessary for ignition. Ignited targets as well as other special targets will provide high x-ray and neutron fluxes for hostile environment certification of weapons subsystems. The Campaign will further pursue high yield target designs on pulsed-power systems.

The **Defense Applications and Modeling Campaign** will provide 3-D, high-fidelity, physics, full-system simulation codes required for engineering, safety, and performance analyses of the stockpile. The Campaign will provide the next generation of progressively higher performance software needed to implement virtual testing and prototyping. The Campaign will also further develop and demonstrate to evaluate, assess, and document the predictive capabilities of the codes and their underlying models. These high-performance computational modeling and numerical simulation capabilities are necessary to support the science-based stockpile stewardship program in the absence of underground nuclear testing.

The **readiness campaigns** are required to fill gaps in the manufacturing base infrastructure within the nuclear weapons complex. Some manufacturing processes and capabilities are no longer practical, and the

ability to manufacture plutonium components (pits) was not maintained. Without a viable manufacturing capability, the U.S. nuclear deterrent cannot be maintained. These campaigns are driven by the current work required to maintain the stockpile as characterized by the Stockpile Life Extension Process (SLEP) and the need to respond to stockpile problems in a timely manner as the problems emerge.

The **Pit Readiness Campaign** will reconstitute pit manufacturing within the DOE nuclear weapons production complex including the reestablishment of technical capability to manufacture war reserve pits for the enduring stockpile and a near-term capacity to produce nominally 20 pits per year at LANL. It will also continue to assess and plan for long-term manufacturing capacity requirements. The closure of the Rocky Flats Plant eliminated this capability within the production complex. It must be reestablished to support the President's directed stockpile level requirements and to continue surveillance of the stockpile to certify its ability to meet military requirements. This requires an infrastructure in terms of technology, people, equipment, and procedures to provide for the pit manufacturing mission.

The **Secondary Readiness Campaign** will ensure future manufacturing capabilities (equipment, people, processes) are in place and ready for production of secondaries. This includes the reestablishment of special materials processing, replacement of sunset technologies, development of technical work force competencies, and the development of component certification/recertification techniques. This campaign develops, implements, and maintains appropriate capability and capacity to accomplish Directed Stockpile Work, and responds to surge production scenarios to manufacture/remanufacture replacement components for all weapon systems in the active stockpile.

The **HE/Assembly Readiness Campaign** will ensure that the high explosives component requalification, and assembly/disassembly operations are fully ready to support mission requirements. To that end, campaign activities determine the current state of readiness of the associated manufacturing technologies, capacities, facilities and personnel, identify where existing or potential shortfalls exist in each of these areas given production scenarios over a foreseeable future. This campaign will also establish and manage a program of activities to correct those shortfalls to ensure these capabilities will be available to support production readiness.

The **Nonnuclear Readiness Campaign** addresses a complex range associated with the numerous and diverse technologies required to maintain and upgrade the stockpile. Nonnuclear products perform the electrical-electronic functions for weapon command and control, arm and supply detonator energy, and examine performance during deployment simulations. Weapon structural features and component containers are made from engineered materials such as plastics and composites or from a variety of metals. Neutron generators, reservoirs, actuators, and items in the nuclear explosive package perform in the weapons explosive sequence and provide survivability functions during storage and usage situations.

The **Materials Readiness Campaign** will provide the critical nuclear and special non-nuclear materials needed for both production and R&D in the nuclear weapons complex, along with modern materials management and information systems. The numbers of weapon components in storage, as well as those requiring packaging and shipping have increased significantly over the past 10 years as a result of dismantlement and stockpile modernization efforts. Current distributed storage and inventory management is limited, inefficient and lacks necessary integration. This campaign will include activities supporting the construction of a new Highly Enriched Uranium (HEU) storage facility at Y-12 which will support the consolidation of all long-term HEU material into a single, state-of -the-art facility. It will also include planning activities for new nuclear material storage vaults at LANL and Pantex to provide for long-term storage of the national plutonium assets.

The **Tritium Readiness Campaign** will provide a source of tritium consistent with the Secretarial decision in December 1998. This designated the Commercial Light Water Reactor option as the primary tritium supply, with the linear accelerator to be developed as backup technology. New tritium is needed to support current requirements for the nuclear weapons stockpile and the 5-year tritium reserve. DOE-provided tritium-producing rods will be irradiated in the Watts Bar and Sequoyah Reactors. Extraction of the tritium gas from the rods will take place at the Tritium Extraction Facility which is being constructed at the Savannah River Site.

Readiness in Technical Base and Facilities (RTBF)

Readiness in Technical Base and Facilities (RTBF) provides the physical infrastructure and operational readiness at the national laboratories, the Nevada Test Site, production sites and other DP sites required to conduct the scientific, technical, and manufacturing activities of the Stockpile Stewardship program. RTBF consists of seven subcategories: Operations of Facilities, Program Readiness, Special Projects, Material Recycle and Recovery, Containers, Storage, and Advanced Simulation and Computing.

Operations of Facilities includes DP's share of the cost to operate and maintain Defense Programs-owned programmatic facilities in "warm standby" mode, a state of readiness at which each facility is prepared to execute programmatic tasks identified in the campaigns and DSW. This category includes DP's share of the cost of all structures, equipment, systems, materials, procedures and personnel necessary to provide program sponsors with a facility that is safe, secure, reliable and "ready for operations."

Program Readiness includes activities that support more than one facility, campaign, or DSW activity and are essential to achieving each program's objectives. The activities may vary from site to site due to the inherent differences in site activities and organizational structure. An example of a Program Readiness activity would be target fabrication in support of weapons experiments.

Special Projects include activities which require special control, visibility, or do not fit easily into other budget categories.

Material Recycle and Recovery includes the recycle and recovery of plutonium, enriched uranium, and tritium from fabrication and assembly operations, limited life components, and dismantlement of weapons and components. Involves the process on recycling and purifying the above materials to meet specifications for safe, secure, and environmentally acceptable storage, including meeting the directive schedule for tritium reservoir refills.

Containers includes research and development, design, recertification and maintenance, off-site transportation certification of component containers in accordance with federal regulations, off-site transportation authorization of non-certifiable nuclear materials transportation configuration; test and evaluation, production/procurement, fielding and maintenance, and decontamination and disposal to provide adequate quantities of containers to support the nuclear weapons mission (transportation and storage).

Storage provides for the cost of storage of weapons material and components. Does not include the cost of temporary storage of materials awaiting processing, staging for dismantlement, or any other interim storage.

Advanced Simulation and Computing provides the computational infrastructure necessary to support Stockpile Stewardship programs. This category includes integrated computing systems (platforms); networks and networking; the means to deploy the networking infrastructure, including the Visual Interactive Environment for Weapons Simulation (VIEWS); and all other traditional Accelerated Strategic Computing Initiative & Stockpile Computing strategies such as Problem Solving Environments; DisCom2; PathForward; One Program / Three Labs; University Partnerships; as well as the traditional core computing maintenance programs for computational sciences, and archived databases.

Decision Unit: Secure Transportation Asset

Secure Transportation Asset provides for the safe, secure movement of nuclear weapons, Special Nuclear Material, selected non-nuclear weapons components, and limited-life components to and from military locations and between nuclear weapon complex facilities within the continental United States.

Decision Unit: Program Direction

Program Direction captures all Federal planning and oversight activities including salary, benefits, and travel of Federal personnel, advisory and assistance support to Federal personnel, and the contractual and other support services necessary to operate Federal offices. Funding for the TSD couriers has been moved to the Secure Transportation Asset decision unit.

Decision Unit: Construction

Construction includes all line item, infrastructure and programmatic construction projects previously budgeted for under Stockpile Stewardship and Stockpile Management decision units. As line items are each a separate Congressional control, this category is essentially unchanged from the current budget structure.

Crosswalk:
Old Budget Structure to New Budget Structure
FY 1999 Adjusted

(dollars in thousands)

	Direct Stockpile Work	Campaigns	Readiness in Technical Base and Facilities	Secure Transport- ation Asset	Program Direction	Constr- uction
<u>Old Structure - Adjusted</u>						
Weapons Stockpile Stewardship						
Core Stockpile Stewardship	204,535	492,792	753,159			
Inertial Confinement Fusion		97,624	121,558			
Technology Partnerships		42,163	925			
Education			9,000			
Construction						391,326
Total, Weapons Stockpile Stewardship	204,535	632,579	884,642	0	0	391,326
Weapons Stockpile Management						
Core Stockpile Management	517,023	86,670	861,028	65,000	9,600	
Enhanced Surveillance		52,318				
ADaPT		59,095				
Tritium Source		141,000				
Materials		27,911				
Construction						127,658
PY work conducted in FY99			28,558			
Total, Weapons Stockpile Management	517,023	366,994	889,586	65,000	9,600	127,658
Program Direction			10,000	26,391	211,456	
TOTAL, Adjusted Weapons Activities	721,558	999,573	1,784,228	91,391	221,056	518,984
Total, Adjusted Weapons Activities	4,336,790					
Transfers to Other Programs	110,353					
Use of Prior Year Balances	-50,994					
FY 1999 Actual Appropriation	4,396,149					

Crosswalk:
Old Budget Structure to New Budget Structure
FY 2000 Adjusted

(dollars in thousands)

	Direct Stockpile Work	Campaigns	Readiness in Technical Base and Facilities	Secure Transport- ation Asset	Program Direction	Constr- uction
<u>Old Structure - Adjusted</u>						
Weapons Stockpile Stewardship						
Core Stockpile Stewardship	235,688	506,422	825,800			
Inertial Confinement Fusion		99,737	126,586			
Technology Partnerships	375	7,220	4,980			
Education			18,529			
Construction						375,309
Total, Weapons Stockpile Stewardship	236,063	613,379	975,895	0	0	375,309
Weapons Stockpile Management						
Core Stockpile Management	523,914	85,215	829,391			
Enhanced Surveillance		49,008	35,091			
ADaPT		52,092	29,611			
Tritium Source		100,602				
Materials		28,302				
Construction						154,947
Total, Weapons Stockpile Management	523,914	315,219	894,093	0	0	154,947
Transportation Safeguards Division				91,463		
Program Direction					203,628	
TOTAL, Adjusted Weapons Activities	759,977	928,598	1,869,988	91,463	203,628	530,256
Total, Adjusted Weapons Activities	4,383,910					
Supplemental Request	-55,000					
Transfers to Other Programs	105,810					
Use of Prior Year Balances	-7,668					
FY 2000 Actual Appropriation	4,427,052					

Weapons Activities Account Summary

(dollars in thousands)

	FY 1999 Current Appropriation	FY 2000 Current Appropriation	FY 2001 Request
Weapons Activities: New Structure			
Stewardship Operation and Maintenance (O&M)			
Directed Stockpile Work			
Stockpile Stewardship	204,535	236,063	
Stockpile Management	517,023	523,914 ^a	
Total, Directed Stockpile Work	721,558	759,977	836,603
Campaigns			
Stockpile Stewardship	632,579	613,379	
Stockpile Management	366,994	315,219 ^b	
Total, Campaigns	999,573	928,598	1,049,907
Readiness in Technical Base and Facilities			
Stockpile Stewardship	884,642	975,895	
Stockpile Management	861,028	894,093 ^c	
Stockpile Management (PY Work Conducted in FY 1999)	28,558		
Program Direction	10,000	0	
Total, Readiness in Technical Base and Facilities	1,784,228	1,869,988	1,953,573
Total, Stewardship O&M	3,505,359	3,558,563	3,840,083
Secure Transportation Asset			
Stockpile Management	65,000	0	
Program Direction	26,391	0	
Transportation Safeguards Division	0	91,463	
Total, Secure Transportation Asset	91,391	91,463	115,673

^aReflects \$6,500,000 of the proposed \$55,000,000 supplemental request for Weapons Activities. Details can be found in the Department's FY 2000 Supplemental Request.

^bReflects \$7,460,000 of the proposed \$55,000,000 supplemental request for Weapons Activities. Details can be found in the Department's FY 2000 Supplemental Request.

^cReflects \$41,040,000 of the proposed \$55,000,000 supplemental request for Weapons Activities. Details can be found in the Department's FY 2000 Supplemental Request.

(dollars in thousands)

Weapons Activities: New Structure-continued

	FY 1999 Current Appropriation	FY 2000 Current Appropriation	FY 2001 Request
Program Direction			
Stockpile Management	9,600	0	
Program Direction	211,456	203,628	
Total, Program Direction	221,056	203,628	224,071
Construction			
Stockpile Stewardship	391,326	375,309	
Stockpile Management	127,658	154,947	
Total, Construction	518,984	530,256	414,173
Subtotal, Office of Defense Programs	4,336,790	4,383,910	4,594,000
Transfers			
Stockpile Management (Emergency Response)	76,200	71,740	
Program Direction (Emergency Response)	2,153	2,192	
Stockpile Management (Storage and Surveillance of Surplus Materials)	32,000	31,878	
Total, Transfers	110,353	105,810	0
Subtotal, Weapons Activities	4,447,143	4,489,720	4,594,000
Use of Prior Year Balances	-50,994	-7,668	
Less Use of Proposed Supplemental	0	-55,000	
TOTAL, Weapons Activities	4,396,149	4,427,052	4,594,000

Weapons Activities: Old Structure

Stockpile Stewardship	2,113,082	2,200,646	
Stockpile Management	2,084,061	1,991,791	
Transportation Safeguards Division	0	91,463	
Program Direction	250,000	205,820	
Subtotal, Weapons Activities	4,447,143	4,489,720	4,594,000
Use of Prior Year Balances	-50,994	-7,668	
Less Use of Proposed Supplemental		-55,000	
TOTAL, Weapons Activities	4,396,149	4,427,052	4,594,000

Transfers

Program Mission

The following previous functions performed by the Office of Defense Programs under the Weapons Activities appropriation have been transferred to other appropriate programs within the Department:

Radiological/Nuclear Accident Emergency Response Program

The responsibility for the Radiological/Nuclear Accident Emergency Response Program has been transferred from the Office of Defense Programs to the Office of Security and Emergency Operations under the Other Defense Activities appropriation. The Secretary directed the transfer of these functions on August 9, 1999. The program was previously funded under the Stockpile Management decision unit with the federal support funded under Program Direction.

This program provides the capability for DOE to immediately respond to radiological accidents/incidents worldwide. This program provides overall program management and organizational structure during both emergency and non-emergency conditions for the personnel, equipment, and activities that collectively comprise the response capability.

A further detailed program description can be found within the Other Defense Activities appropriation under the Office of Security and Emergency Operations/Emergency Management.

Storage and Surveillance of Surplus Materials

The responsibility for storage and surveillance of excess plutonium and highly enriched uranium (HEU) has been transferred from the Office of Defense Programs to the Office of Fissile Materials Disposition under the Other Nuclear Security Activities appropriation. This transfer was recommended in the House and Senate FY 2000 Authorization reports. These activities were previously funded within the Stockpile Management decision unit.

The activities to be transferred include the storage of excess Special Nuclear Material (SNM) at LANL and Y-12 and storage of excess plutonium pits at Pantex. A further detailed program description can be found within the Other Nuclear Security Activities appropriation under the Office of Fissile Materials Disposition.

Funding Profile

(dollars in thousands)

	FY 1999 Current Appropriation	FY 2000 Original Appropriation	FY 2000 Adjustments	FY 2000 Current Appropriation	FY 2001 Request
Other Programs	4,336,790	4,400,515	-16,605	4,383,910	4,594,000
Transfers					
Emergency Response					
Stockpile Management	76,200	77,600	-5,860 ^a	71,740	0
Program Direction	2,153	2,200	-8 ^b	2,192	0
Total, Emergency Response . . .	78,353	79,800	-5,868	73,932	0
Storage and Surveillance of Surplus Materials					
Stockpile Management	32,000	31,878	0	31,878	0
Subtotal, Transfers	110,353	111,678	-5,868	105,810	0
Adjustments		-5,586	5,586		
Total, Transfers	110,353	106,092	-282	105,810	0
Subtotal, Weapons Activities	4,447,143	4,506,607	-16,887	4,489,720	4,594,000
Use of Prior Year Balances	-50,994	-7,668		-7,668	
Less Use of Proposed Supplemental		-55,000		-55,000	
Total, Weapons Activities	4,396,149	4,443,939	-16,887	4,427,052	4,594,000

^aReflects the allocated share of \$5,586,000 of the \$29,800,000 General Reduction in the FY 2000 Weapons Appropriation; and reflects \$274,000 of the \$16,887,000 Rescission under Public Law 106-113.

^bReflects the allocated share of \$8,000 of the \$16,887,000 Rescission under Public Law 106-113.

Stewardship O&M

Program Mission

The mission of the Stewardship Operations & Maintenance (O&M) program is to further strengthen U.S. national security and reduce the global danger from weapons of mass destruction.

Program Goals/Objectives

There are three national security goals/objectives in the DOE Strategic Plan upon which this program and budget are based:

- NS-1 Maintain and refurbish nuclear weapons in accordance with directed schedules to sustain confidence in their safety and reliability, indefinitely, under the nuclear testing moratorium and arms reduction treaties.
- NS-2 Achieve a robust and vital scientific, engineering, and manufacturing capability to enable the future certification of the enduring stockpile and the manufacture of nuclear weapon components under the nuclear testing moratorium.
- NS-3 Ensure the vitality and readiness of DOE's nuclear security enterprise.

Program Overview

As described in the Executive Summary, the Stockpile Stewardship O&M decision unit has three components: Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities. Together, these three components form an integrated science-based stockpile stewardship program. The programs have been balanced to develop and maintain essential scientific and technical capabilities over the long term while meeting near term stockpile workload requirements and schedules, within an integrated complex with unique and interdependent facilities.

Directed Stockpile Work (DSW), designed to ensure that stockpiled weapons meet military requirements, encompasses all activities that directly support weapons in the enduring nuclear stockpile as directed by the Nuclear Weapon Stockpile Plan, including current maintenance and day-to-day care as well as planned refurbishments as outlined by the Stockpile Life Extension Program (SLEP). This category also includes stockpile evaluation; and research, development and certification activities in direct support of each weapon as well as the realization of new technologies to maintain that readiness for as long into the future as required. These activities are conducted at the laboratories and production plants. The components of DSW include Stockpile Research and Development; Stockpile Maintenance; Stockpile Evaluation; Dismantlement/Disposal; Production Support; and Field Engineering, Training, and Manuals.

Campaigns are focused scientific and engineering efforts which will develop and maintain critical capabilities and tools needed for continued certification of the stockpile now and into the future, in the absence of underground nuclear testing. The goal of these multi-year, multi-functional campaigns is to provide the capability to address current or future questions or issues by employing the best scientists and engineers and using the most advanced sciences and technologies. Campaigns have defined milestones, specific work plans, and specific end-dates, effectively focusing research and development activities on clearly defined deliverables. Funding is requested for the following 15 Campaigns: Primary Certification, Dynamic Materials Properties, Advanced Radiography, Secondary Certification and Nuclear Systems Margins, Inertial Confinement Fusion Ignition and High Yield, Certification in Hostile Environments,

Defense Applications and Modeling, Weapon System Engineering Certification, Enhanced Surety, Enhanced Surveillance, Advanced Design and Production Technologies, Pit Manufacturing Readiness, Materials Readiness, Secondary Readiness, and Tritium Readiness. No funding is requested in FY 2001 for two additional campaigns, High Explosives/Assembly Readiness and Nonnuclear Readiness; however, Defense Programs plans to request funding for these campaigns in FY 2002. Defense Programs will be developing baseline end dates for all campaigns in FY 2000.

Readiness in Technical Base and Facilities (RTBF) provides the underlying physical infrastructure and operational readiness at the national laboratories, the Nevada Test Site, production sites and other DP sites required to support scientific, engineering, and manufacturing activities in the Directed Stockpile Work and Campaigns. RTBF consists of seven subcategories: Operations of Facilities, Program Readiness, Special Projects, Material Recycle and Recovery, Containers, Storage, and Advanced Simulation and Computing.

Funding for line-item construction projects, including all line item, infrastructure and programmatic construction projects previously budgeted for under Stockpile Stewardship and Stockpile Management decision units, are found in the Construction section of this budget.

Performance Measures

For **FY 2001**, the Stockpile Stewardship Program will support the following performance measures:

- # Meet all annual weapons maintenance and refurbishment schedules developed jointly by DOE and DoD.
- # Annually report to the President on the need or lack of need to resume underground nuclear testing to certify the safety and reliability of the nuclear weapon stockpile.
- # Provide the scientific understanding of the nuclear package of weapons systems to sustain our ability to certify the nuclear weapons stockpile without underground nuclear testing.
- # Develop the simulation and modeling tools and capabilities to implement virtual testing of nuclear weapons and components in the absence of underground nuclear testing.
- # Provide specific tools and capabilities and components necessary to sustain the viability of the nuclear weapons manufacturing base within the nuclear weapons complex, including a reliable source of tritium by FY 2006.
- # Ensure that the physical infrastructure and facilities are operational, safe, secure, compliant, and that a defined state of readiness is sustained at all needed facilities.
- # Ensure that the capability to resume underground nuclear testing is maintained in accordance with the Presidential Decision Directive through a combined experimental and test readiness program.
- # Ensure the availability of a workforce with the critical skills necessary to meet long term requirements.

Significant Accomplishments and Program Shifts

During the last year, Defense Programs has continued a series of post-Cold War reforms which have moved the Stockpile Stewardship Program towards a single, tightly integrated program. These changes are designed to respond to several significant issues which Defense Programs must be able to address now and in the future. These issues include: weapon refurbishments; an aging workforce in the nuclear

weapons complex; an aging stockpile that must be maintained; and the need for intensive internal and external review to ensure that the program will achieve its goals, while preserving the institutional viability of the laboratories, production plants, and the test site.

Defense Programs has developed an **integrated budget structure** to support the program management requirements for the Stockpile Stewardship Program. Most of the activities previously funded by O&M funding in the Core Stewardship, Inertial Confinement Fusion, Technology Partnerships, Education, and Core Management components of the old budget structure have transitioned to Stewardship O&M in the new budget structure.

Activities previously included in the Accelerated Strategic Computing Initiative (ASCI) are now budgeted for in the Defense Applications and Modeling campaign and the Advanced Simulation and Computing component of RTBF. Defense Programs continues to manage ASCI as an integrated program, progressing toward the previously identified ASCI goals.

Although Defense Programs will continue to support various technology partnerships within Campaigns as a means to reach the goals and objectives of the Stockpile Stewardship Program, there is no longer a specific Technology Partnership decision unit in the budget. Ongoing Technology Partnership activities are budgeted for in the campaign which they support.

In addition to the new budget structure, Defense Programs has established a **planning process** designed to enable Defense Programs to make the right strategic decisions for an uncertain future. The rigorous planning process clearly defines programmatic milestones to be achieved within an integrated Stockpile Stewardship Program. This approach is designed to ensure that production capabilities and capacity are in place when needed; to have the significant experimental and computational facilities available in time to annually certify the stockpile and to impact the SLEP schedule; and to preserve premier science and engineering capabilities required to maintain, refurbish, and modernize nuclear weapons.

During **FY 1999 and FY 2000**, implementation of the Stockpile Stewardship Program, initiated in FY 1994, continued in accordance with the Stockpile Stewardship Plan and resulted in the following accomplishments:

- # Successfully completed the third annual certification of the safety and reliability of the U.S. nuclear weapons stockpile according to DOE/DoD procedures. On December 22, 1998, the Secretaries of Energy and Defense certified to the President that the nuclear stockpile is safe, secure, and reliable; and that there was no need to resume underground nuclear testing. The current annual certification process is nearly complete.
- # Maintained the capability to resume underground nuclear testing in accordance with the Presidential Decision Directive through a combined experimental and test readiness program.
- # Met nine of the eleven weapon alterations; developed recovery schedules with the DoD for two weapon alterations (W87 Alt 342 and B83 Alt 752) not completed as originally scheduled.
- # Delivered limited life components consistent with Production and Planning Directives 99-2 and 2000-0.
- # Began first production of the W76 ACORN and Neutron Generator.
- # Delivered five W88 development pits.
- # Completed Dual Revalidation of the W76 warhead.

- # Through the Enhanced Surveillance Program, continued the development of new diagnostics techniques and began the integration of new diagnostics into the ongoing weapon surveillance program. Developed and successfully flight tested the first enhanced fidelity instrumentation system. Developed the technical basis for age-driven component refurbishment decisions in support of the W76 and W80 6.2/6.2A studies. (See Directed Stockpile Work for an explanation of the Phase 6.X process which provides a framework to conduct and manage life extension activities for existing weapons.)
- # Began the 6.2/6.2A life extension studies for the W76, W80, and B61- 7,11.
- # Achieved first production for the W87 Life Extension Program in February 1999 as scheduled; made first delivery to the Air Force in May 1999; continuing production and monthly shipments that are scheduled to continue through calendar year 2003.
- # Exceeded original performance goal by more than 30%, demonstrating operation of ASCI Blue Pacific system at 3.8 trillion operations per second (TeraOps), ASCI Red system at 3.15 TeraOps, and ASCI Blue Mountain system at 3.07 TeraOps.
- # Delivered a computer code capable of performing a three-dimensional analysis of the dynamic behavior of a nuclear weapon, including a prediction of the total explosive yield.
- # Developed and implemented visualization, networking and data management systems to efficiently support utilization of ASCI codes and computers across the weapons complex.
- # Demonstrated and deployed a parallel high-performance network architecture.
- # Provided leading-edge, high-end simulation capabilities supporting numerous stockpile stewardship applications such as:
 - Resolved a nuclear test anomaly by using a 3-D ASCI application code which required four months on ASCI Blue Mountain machine, but would have taken 80 years on a Cray-class supercomputer.
 - Simulated a nuclear-test diagnostic measurement for the first time which required one day on ASCI Blue Mountain machine, but would have required 2-3 years on a Cray-class computer.
 - Simulated re-entry body response to a hostile radiation environment as requested by DoD to define a future Stockpile-to-Target Sequence test program.
- # Implemented Secure Connectivity between the plants and the laboratories, including secure E-mail and File Transfer Protocol.
- # Demonstrated collaborative exchange of assembly product models for concurrent evaluation of SLEP and alternative designs between the plants and the laboratories.
- # Conducted subcritical experiments at the Nevada Test Site to provide valuable scientific information about the behavior of nuclear materials during the implosion phase of a nuclear weapon, including high-pressure equation-of-state and ejecta evolution for plutonium.
- # Completed conditional certification of MC4380 neutron generator to hostile environments, demonstrating the efficacy of a certification process based on validated models plus aboveground experiments.

- # Conducted experimental and theoretical hydrodynamic experiments necessary to maintain or advance research, development, and engineering capabilities in nuclear materials science and weapons design.
- # Conducted radiation-flow experiments at Inertial Confinement Fusion (ICF) facilities: Nova, Omega, and Z. Confirmed that aboveground experiments, coupled with detailed modeling, can achieve weapons physics goals.
- # Conducted approximately 1,500 experiments on laser and pulsed power ICF facilities, primarily in the areas of ignition and weapons physics. These experiments enhanced our understanding of areas of physics relevant to a better predictive assessment of nuclear weapons performance.
- # Completed 120 shots at the Omega laser through the National Laser Users Facility program in support of university research.
- # Demonstrated a breakthrough in materials research by producing metallic hydrogen for the first time in an ICF facility.
- # Developed the capability on the Z pulsed power facility to utilize the isentropic compression technique for accurate measurements of the properties of materials of interest to the weapons program. Experiments on Z validated the calculated energetics and power flow coupling in target configurations.
- # Developed the body-under-source field effect transistor (BUSFET), a radiation-hardened silicon-on-insulator (SOI) device structure applicable to both strategic and satellite use.
- # Successfully completed first hydrodynamic test using the first axis of the Dual-Axis Radiographic Hydrodynamic Test (DARHT) Facility.
- # Demonstrated that high explosive aging does not degrade safety during impacts in accident conditions. Developed and delivered several new high explosive tests into the surveillance program (high explosive divergence and detonator booster performance tests).
- # Identified self-irradiation (caused by plutonium nuclear decay) as a cause for pit aging and began testing old pit materials.
- # Began fabrication of plutonium alloys in which the aging process is accelerated to allow direct measurements of effects of aging on plutonium properties.
- # Fielded a suite of experimental diagnostic tools to measure physical properties of new and aged plutonium samples.
- # Completed preparation for accelerated aging experiments for plutonium.
- # Utilized new miniaturized instrumentation to characterize key features during missile flight tests while preserving system fidelity to the greatest extent possible.
- # Completed modeling of safety and reliability critical strong links and firesets.
- # Completed Y-12 receipt of HEU parts and Pantex receipt of pits from the Rocky Flats Environmental Technology Site in FY 1999.

- # Established strategic alliances and collaborations among the weapons laboratories, industries, and universities to enable effective use of scientific and technical personnel throughout the R&D community.
- # In FY 1999, Defense Programs eliminated the personnel security reinvestigation backlog of 8,705 cases, at all Albuquerque, Nevada, and Oakland Operations Office contractor sites and at the Oak Ridge Y-12 Plant, inherited from the Office of Nonproliferation and National Security.
- # Achieved “Satisfactory” rating from the Department's safeguards and security independent inspection conducted by the Office of Security and Performance Assurance through re-inspections of LANL, LLNL, SNL, and the Secure Transportation Asset in December 1999. The focus of these inspections was physical security as well as meeting the Secretary's Nine and Six Point Plans for further enhancements for cyber security.
- # Initiated actions to reduce contractor travel per Congressional direction. The travel ceiling for the Defense Programs contractors in FY 2000 is \$79.6 million, which is a reduction of about 27% from the actual contractor travel expenditures in FY 1999.

Conceptual Design Reports and Post-Conceptual Design Engineering

Defense Programs has completed or is planning to conduct the following conceptual design activities during the budget period, none of which are expected to exceed \$3 million.

In FY 1999, Defense Programs initiated a conceptual design for the Microsystems and Engineering Sciences Applications (MESA) project; this conceptual design will be completed in FY 2000. The MESA project is a candidate for Title I, Preliminary Design, under the Preliminary Project Design and Engineering project in FY 2001.

The Department recognizes the need for a replacement for the Chemistry and Metallurgy Research (CMR) building at Los Alamos National Laboratory and plans to initiate conceptual design for this facility in FY 2000.

In FY 2000, the Department will also initiate conceptual design for the Special Materials Complex at Y-12 which is a candidate for Title I, Preliminary Design, under the Preliminary Project Design and Engineering project in FY 2001.

Conceptual design for the Enriched Uranium Manufacturing Facility at the Y-12 Plant will be initiated in FY 2001 in anticipation of an FY 2002 construction line item.

National Ignition Facility

In response to projected cost increases and schedule delays associated with the National Ignition Facility Project (NIF), significant changes have been made in NIF's execution plan to address cleanliness problems in assembling and installing the laser and target system infrastructure. A new NIF baseline, currently being developed, will be certified by the Department and submitted to Congress by June 1, 2000. DOE plans to accommodate additional FY 2001 funding needs for the NIF which result from the new baseline or related activities, if any, within the budgets for DOE Defense Programs and the Lawrence Livermore National Laboratory.

Site-Related Environmental Documentation

Defense Programs oversees and coordinates environmental documentation activities at the three weapons laboratories, the Nevada Test Site, and the production plants, as the Department's landlord, although funding is provided by all affected activities at each site. The Stockpile Stewardship and Management (SSM) programmatic environmental impact statement (PEIS), the basis of the FY 1997 Record of Decision for Defense Programs, is the base document from which other National Environmental Protection Act (NEPA) documents are tiered.

- # The Los Alamos National Laboratory site-wide environmental impact statement (SWEIS) was completed in February 1999, and the Record of Decision was issued in September 1999.
- # The Pit Manufacturing Supplement Analysis, required by Court order resulting from a lawsuit on the SSM PEIS, was filed in the US District Court and distributed to the public in September 1999.
- # The Final EIS on the Conveyance and Transfer of Certain Land Tracts from Los Alamos was issued in January 2000. A Record of Decision is planned for March 2000.
- # The Sandia National Laboratories (New Mexico) SWEIS was completed in October 1999, and the Record of Decision was issued in December 1999.
- # Defense Programs conducted a 5-year review or supplement analysis of the Lawrence Livermore National Laboratory/Sandia National Laboratories (California) SWEIS, originally completed in 1992; a determination on this supplement analysis was issued in March 1999. Defense Programs is currently reviewing options to upgrade the SWEIS coverage beyond 2002. One of the options could be to complete a new SWEIS.
- # Defense Programs is preparing a supplemental EIS for NIF to review the environmental impacts of additional information discovered since the Stockpile Stewardship and Management PEIS was completed. Final supplemental EIS expected to be approved in March 2000.
- # A draft SWEIS for the Y-12 facility at Oak Ridge, Tennessee is currently under development. Release of the draft for public review is scheduled for April 2000.
- # The following three tritium related EIS's were tiered from the programmatic tritium EIS and were all completed early in 1999. The Commercial Light Water EIS was developed by DP Headquarters. The Accelerator Production of Tritium EIS as well as the Tritium Extraction Facility EIS were administered by HQ but developed at the Savannah River Site. A Consolidated Record of Decision was placed in the *Federal Register* on May 14, 1999.

Funding Profile

(dollars in thousands)

NEW STRUCTURE	FY 1999 Current Appropriation	FY 2000 Original Appropriation	FY 2000 Adjustments	FY 2000 Current Appropriation	FY 2001 Request
Stewardship O&M					
Directed Stockpile Work	721,558	764,503	-4,526	759,977	836,603
Campaigns	999,573	939,578	-10,980	928,598	1,049,907
Readiness in Technical Base & Facilities	1,755,670	1,862,117	7,871	1,869,988	1,953,573
PY Work Conducted in					
FY 1999	28,558	0	0	0	0
Subtotal, Stewardship O&M	3,505,359	3,566,198	-7,635	3,558,563	3,840,083
Adjustments	0	-49,169 ^a	49,169	0	0
Less Use of Proposed Supplemental Request . .	0	55,000 ^b	-55,000	0	0
Total, Stewardship O&M . . .	3,505,359	3,572,029	-13,466^c	3,558,563	3,840,083

Public Law Authorization:

Public Law 106-65, National Defense Authorization Act for FY 2000.

Public Law 106-113, Rescission

^a Reflects \$30,000,000 of the Contractor Travel Savings, \$5,000,000 of the directed M&O Contractors at Headquarters Savings, and the allocated share of \$14,169,000 of the \$29,800,000 General Reduction, in the Weapons Activities appropriation.

^b Reflects FY 2000 Supplemental Request of \$6,500,000 to Directed Stockpile Work, \$7,460,000 to Campaigns; and \$41,040,000 to Readiness in Technical Base and Facilities. Details can be found in the Department's FY 2000 Supplemental Request.

^c Reflects allocated share of the rescission of \$16,887,000 in Public Law 106-113.

Funding Profile

(dollars in thousands)

OLD STRUCTURE	FY 1999 Current Appropriation	FY 2000 Original Appropriation	FY 2000 Adjustments	FY 2000 Current Appropriation	FY 2001 Request
Stockpile Stewardship	1,721,756	1,871,055	-45,718	1,825,337	
Stockpile Management	1,773,603	1,695,143	38,083	1,733,226	
Program Direction	10,000 ^a	0	0	0	
Subtotal, Stewardship O&M	3,505,359	3,566,198	-7,635	3,558,563	3,840,083
Adjustments		-49,169 ^b	49,169		
Use of Proposed FY 2000 Supplemental		55,000 ^c	-55,000		
Total, Stewardship O&M	3,505,359	3,572,029	-13,466^d	3,558,563	3,840,083

^a Reflects comparability transfer of \$10,000 from Weapons Program Direction to Stockpile Stewardship for the payment to the Los Alamos School District (\$7,000,000) and the Northern New Mexico Educational Enrichment Foundation (\$3,000,000).

^b Reflects \$30,000,000 of the Contractor Travel Savings, \$5,000,000 of the directed M&O Contractors at Headquarters Savings, and the allocated share of \$14,169,000 of the \$29,800,000 General Reduction, in the Weapons Activities appropriation.

^c Reflects FY 2000 Supplemental Request of \$55,000,000 to Stockpile Management. Details can be found in the Department's FY 2000 Supplemental Request.

^d Reflects allocated share of rescission of \$16,887,000 in Public Law 106-113.

Funding Profile

(dollars in thousands)

FY 1999 Current Appropriation	FY 2000 Current Appropriation	FY 2001 Request
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Stewardship O&M

Directed Stockpile Work

Stockpile Research & Development	204,535	236,063	243,300
Stockpile Maintenance	228,367	240,745	257,994
Stockpile Evaluation	118,842	118,140	151,710
Dismantlement/Disposal	29,767	29,111	29,260
Production Support	136,047	131,830	149,939
Field Engineering, Training & Manuals	4,000	4,088	4,400
Subtotal, DSW	721,558	759,977	836,603

Campaigns

Primary Certification	41,996	29,468	41,400
Dynamic Materials Properties	68,206	62,386	64,408
Advanced Radiography	27,122	37,855	43,000
Secondary Certification & Nuclear Systems Margins	45,520	44,375	52,964
ICF Ignition & High Yield	97,624	99,737	120,800
Certification in Hostile Environments	16,399	13,751	15,400
Defense Applications & Modeling	183,162	227,732	249,100
Weapons System Engineering Certification	23,900	14,924	16,300
Enhanced Surety	47,556	38,276	40,600
Enhanced Surveillance	82,877	74,042	89,651
Advanced Design & Production Technologies	109,630	76,393	75,735
Pit Manufacturing Readiness	75,881	69,969	108,038
Secondary Readiness	0	0	15,000
Nonnuclear Readiness	800	0	0
Materials Readiness	37,900	39,088	40,511
Tritium Readiness	141,000	100,602	77,000
Total, Campaigns	999,573	928,598	1,049,907

Weapons Activities/Stewardship O&M

FY 2001 Congressional Budget

(dollars in thousands)

FY 1999 Current Appropriation	FY 2000 Current Appropriation	FY 2001 Request
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Readiness in Technical Base & Facilities

Operations of Facilities	1,286,979	1,320,478	1,313,432
Program Readiness	92,063	62,509	75,800
Special Projects	24,711	50,817	48,297
Material Recycle and Recovery	17,410	18,649	22,018
Containers	14,127	4,833	7,876
Storage	19,816	15,627	9,075
Advanced Simulation & Computing	300,564	397,075	477,075
Total, Readiness in Technical Base & Facilities	1,755,670	1,869,988	1,953,573
PY Work Conducted in FY 1999	28,558		
Total, Stewardship O&M	3,505,359	3,558,563	3,840,083

Explanation of Funding Changes from FY 2000 to FY 2001

The FY 2001 budget request for *Stockpile Stewardship O&M* is \$3,840.1 million, an increase of \$281.5 million, or 7.9 percent above the FY 2000 comparable level of \$3,558.6 million.

The FY 2001 Request restores *Laboratory Directed Research and Development (LDRD)*, which was capped at 4 percent in the FY 2000 Energy & Water Development Appropriation, to a funding level up to 6 percent of the O&M funding at each laboratory.

Directed Stockpile Work increases \$76.6 million, or 10.1 percent above the FY 2000 comparable level of \$760.0 million, to:

- S meet production schedules in the Master Nuclear Schedule, Volume III, for gas generators, tritium reservoirs, and neutron generators such that no active stockpile weapon becomes inoperable due to the lack of replacement components;
- S meet the annual weapons alteration and modification schedules which are contained in the Production and Planning Directive (P&PD) and further delineated in the Program Control Document (PCD);
- S continue the surveillance and testing required for the safety, security, and reliability of nuclear weapons in the stockpile; and
- S adhere to schedules for safe and secure dismantlement of warheads, as specified in the P&PD, that have been removed from the U.S. nuclear weapons stockpile; and
- S start baselining of weapon systems (W80 and B61-7,11) and focused efforts on the development of improved Joint Test Assemblies, gas transfer systems, and neutron generators.

Campaigns increase \$121.3 million, or 13.1 percent above the FY 2000 comparable level of \$928.6 million, to support the development of the tools and scientific capabilities required to maintain and certify the nuclear stockpile without underground nuclear testing into the future.

The funding increases are needed to:

- S provide for increasingly complex, integrated hydrodynamic radiography and subcritical experiments needed for the development of simulation software and weapon certification;
- S conduct advanced radiography R&D using the first axis of DARHT and begin to define the requirements for future advanced radiography capabilities needed to support primary certification;
- S support design of aboveground experiments to examine HE-induced case dynamics and performance issues required for code validation, and enhance capabilities to model hydrodynamic processes;
- S begin design and prototype of the cryogenic target system for NIF, develop initial set of core diagnostics for NIF, conduct experiments and calculations to develop the physics basis for ignition, and conduct advanced high energy density experiments in support of weapons physics campaigns;
- S begin primary burn code validation; verify and validate the accuracy and fidelity of complex ASCI simulation codes; and continue materials modeling and simulation activities to incorporate materials properties into ASCI application codes;

- S conduct tests on pits to determine weapon vulnerabilities using pits that are the oldest in the stockpile and those that have undergone accelerated aging;
- S continue manufacture of development pits leading to the manufacture of a certifiable W88 pit; and
- S initiate the secondary readiness campaign which will conduct studies and develop/upgrade modernization plans addressing secondary manufacturing infrastructure gaps and take measures to address critical skills needs and issues.

These increases are offset by a decrease in the Tritium Readiness campaign reflecting the suspension of the preliminary design of the accelerator option for the production of tritium.

Within the new budget structure, there no direct funding for *Technology Partnerships*; however, Defense Programs will continue to utilize various technology partnerships within Campaigns as a means to reach the goals and objectives of the Stockpile Stewardship Program. Funding for ongoing Technology Partnership activities are budgeted for in the campaign which they support. No funding is requested for the American Textile Partnership.

Readiness in Technical Base and Facilities increases \$83.6 million, or 4.5 percent above the FY 2000 comparable level of \$1,870.0 million, to accommodate:

- S safe, secure, environmentally-compliant, and cost-effective operation of an aging infrastructure;
- S advanced simulation and computing requirements, including the hardware acquisition and “see and understand” visualization requirements; and
- S payments to the Los Alamos School District and the Northern New Mexico Educational Enrichment Foundation. (Defense Programs plans to complete final funding to the Foundation in FY 2002 per Congressional direction, at which time, funding for the schools will be eliminated.)

Due to other higher priority activities, the **Atlas** facility at Los Alamos National Laboratory will be placed in cold standby in FY 2000.

Further explanations of funding changes for each of these areas are included in the Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities sections of the budget. Additional detailed information can be found in the program plans.

Funding by Site

dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Albuquerque Operations Office					
Albuquerque Operations Office	52,296	38,228	26,000	-12,228	-32.0%
Kansas City Plant	268,943	274,590	285,050	10,460	3.8%
Pantex Plant	241,906	241,950	251,450	9,500	3.9%
Los Alamos National Laboratory	783,675	766,667	812,055	45,388	5.9%
Sandia National Laboratories	710,660	691,301	727,595	36,294	5.3%
Total, Albuquerque Operations Office	2,057,480	2,012,736	2,102,150	89,414	4.4%
Chicago Operations Office					
Argonne Nat'l Lab	3,976	2,165	1,310	-855	-39.5%
Brookhaven Nat'l Lab	707	35	0	-35	-100.0%
Chicago Operations Office	22,296	10,500	39,323	28,823	274.5%
Total, Chicago Operations Office	26,979	12,700	40,633	27,933	219.9%
Idaho Operations Office	5,079	1,500	0	-1,500	-100.0%
Nevada Operations Office	193,346	181,904	187,900	5,996	3.3%
Oak Ridge Operations Office					
Oak Ridge Y-12	390,605	397,092	409,740	12,648	3.2%
OR Science & Technology Institute . .	147	150	150	0	0.0%
Oak Ridge National Laboratory	17,721	18,174	19,718	1,544	8.5%
Oak Ridge Operations Office	2,350	1,992	3,000	1,008	50.6%
Total, Oak Ridge Operations Office	410,823	417,408	432,608	15,200	3.6%
Oakland Operations Office					
General Atomics	9,528	7,926	7,400	-526	-6.6%
Lawrence Livermore Nat'l. Laboratory	450,666	479,885	534,017	54,132	11.3%
Naval Research Laboratory	16,758	14,510	9,750	-4,760	-32.8%
Oakland Operations Office	7,997	6,575	9,200	2,625	39.9%
University of Rochester	28,850	30,439	32,150	1,711	5.6%
Total, Oakland Operations Office	513,799	539,335	592,517	53,182	9.9%
Richland Operations Office					
Pacific Northwest Laboratory	23,517	23,700	9,681	-14,019	-59.2%
Savannah River Operations Office					
Savannah River Westinghouse	121,976	115,212	115,800	588	0.5%

dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Headquarters ^a	123,802	254,068	358,794	104,726	41.2%
Subtotal, Stockpile Stewardship O&M	3,476,801	3,558,563	3,840,083	281,520	7.9%

^a Funding reflected at Headquarters is comprised of two main types of activities: funding for activities where site decisions have yet to be made and funding for “pass through” activities at M&O sites. The “pass through” funding is found mainly in the Advanced Simulation and Computing component of RTBF, and reflects the cost of hardware acquisition, alliances with academia, and partnerships with U.S. industry.

Site Description

Stockpile Stewardship activities are conducted predominantly at the three weapons laboratories, four production facilities, and the Nevada Test Site. The three weapons laboratories include: Lawrence Livermore National Laboratory in California and Los Alamos National Laboratory in New Mexico, both operated by the University of California; Sandia National Laboratories in California and New Mexico, operated by Lockheed Martin. The four production facilities include: Kansas City Plant in Kansas City, Missouri, operated by Allied Signal Aerospace; the Pantex Plant-Amarillo, Texas, operated by Mason & Hanger; the Y-12 Plant-Oak Ridge, Tennessee, operated by Lockheed Martin Energy Systems; and the Savannah River Site-Aiken, South Carolina, operated by Westinghouse Savannah River Company. The Nevada Test Site is operated by Bechtel/Nevada, Inc. Funding is also provided to the University of Rochester, the Naval Research Laboratory, and General Atomics through the Inertial Confinement Fusion program. Other locations are funded as noted on the Funding by Site table above.

Kansas City Plant

The Kansas City Plant is located on 141 acres of the Bannister Federal Complex within the city limits of Kansas City, Missouri, about 12 miles south of downtown. The Kansas City Plant is the main facility in the nuclear weapons complex for the manufacture and procurement of nonnuclear components for nuclear weapons, including electrical, electronic, electromechanical, mechanical, plastic, and nonfissionable metal. The broad range of components and devices procured from U.S. industry is supported by an extensive system to qualify suppliers and accept products.

The Kansas City Plant provides a broad range of standard industrial processes (e.g., plating, machining, metal deposition, molding, painting, heat treating, and welding), some of which are uniquely tailored to meet special weapon reliability requirements. The Kansas City Plant evaluates components and subsystems removed from the stockpile for reuse or testing. The plant is participating with the other plants and laboratories in the Enhanced Surveillance Campaign to predict component and material lifetimes, critical elements of the Stockpile Life Extension Program, and in Advanced Design and Production Technologies (ADaPT) Campaign to develop modular, scalable, and environmentally sound manufacturing processes.

Lawrence Livermore National Laboratory

The Lawrence Livermore National Laboratory (LLNL), was established as a nuclear weapons design laboratory in 1952. It is located on 1.3 square miles in Livermore, California. It has an auxiliary testing range located on 8 square miles situated about 18 miles east of the main site. LLNL's primary mission is to support DOE's Stockpile Stewardship Program to ensure that the Nation's nuclear weapons remain safe, secure, and reliable and to prevent the spread and use of nuclear weapons worldwide. The laboratory brings to this mission extensive experience in supercomputing and laser technology as well as a broad range of world-class science and engineering capabilities, including nuclear science and technology and advanced sensors and instrumentation. LLNL also supports high explosive safety and assembly/disassembly operations at the Pantex Plant, and oversight of uranium and case fabrication and processing technology with support from the Y-12 Plant and LANL. LLNL has demonstrated successes

in assembling multi-disciplinary approaches, applying expertise in advanced defense technologies, energy, environment, biosciences, and basic science, to complex national issues.

Among the major specialized facilities supporting LLNL's programmatic efforts are the ASCI Blue Pacific computer system for high-fidelity weapon simulation, the High Explosive Applications Facility for energetic materials research, and the Flash X-ray Facility for hydrodynamic tests. The Nova laser, previously used for inertial fusion and weapon physics research, was shut down on May 27, 1999, as planned, pending transition to NIF operations.

New projects are underway to prepare LLNL's capabilities for its critical responsibilities to maintain the nuclear deterrent without nuclear testing. The National Ignition Facility (NIF) has been under construction since June 1997 and will be the world's largest and most powerful laser facility when completed. NIF will perform fusion, weapon-physics, and weapon-effects experiments in support of the Stockpile Stewardship Program. An important step toward meeting the DOE's goal of establishing the advanced weapon simulation capability required by the Stockpile Stewardship Program will be the construction of the Terascale Simulation Facility (TSF). The TSF, which will begin design in FY 2000 and be completed in FY 2006, will house the current ASCI Option White Supercomputer.

Los Alamos National Laboratory

The Los Alamos National Laboratory (LANL), established as a nuclear weapons design laboratory in 1943, is located on about 28,000 acres adjacent to the town of Los Alamos, New Mexico, which is approximately 25 miles northwest of Santa Fe.

The core competencies at LANL supporting the Stockpile Stewardship Program include theory, modeling and simulation, and high-performance computing to model a broad range of physical, chemical, and biological processes; complex experiments and measurements; nuclear and advanced materials; and nuclear weapons science and technology including the physics of nuclear weapons design and large-scale calculations of weapons phenomena. LANL also possesses unique capabilities in neutron science required for stockpile stewardship and enhanced surveillance and shares with LLNL the responsibility for the safety, reliability, and performance of the Nation's nuclear weapons. Other activities include plutonium fabrication and processing technology development; oversight of tritium reservoir surveillance, testing, and tritium recycle technology; support of high explosive science focused on safety, reliability and performance; detonator development, production, and surveillance; beryllium fabrication; neutron tube target loading, and pit component production and surveillance.

Among the major specialized facilities at LANL are the TA-55 Plutonium Facility for surveillance of plutonium "pits" and plutonium pit manufacturing, actinide research, and nuclear waste research and the Los Alamos Neutron Scattering Center user facility for supporting advanced materials science, nuclear science and particle-beam accelerator technology in addition to weapons surveillance. The Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility is expected to be completed at the end of FY 2002; the first axis became operational for experimental use in FY 1999. DARHT's dual-axis, multi-time viewing capability will replace LANL's current diagnostic tool for hydrodynamic testing, the Pulsed High-Energy Radiographic Machine Emitting X-Rays (PHERMEX), and provide crucial experimental data on many of the stockpile systems. In addition, the Strategic Computing Complex will be operational in early FY 2002 to house the next generation (30 TeraOps) ASCI supercomputer.

A plutonium pit manufacturing mission is being reestablished at LANL to replace units destructively tested in the surveillance program and to replace pits in the future should surveillance indicate a problem with a pit. DOE is instituting a phased approach to assure the capability to manufacture is retained and then to establish a capacity to manufacture a number of pits per year.

LANL has a major role in DOE's backup technology for a new tritium production source. LANL directs the APT National Project Office which is responsible for the engineering, development and demonstration activities to verify technical issues and the preliminary design of the APT.

Nevada Test Site

The Nevada Test Site (NTS), established in 1950, encompasses approximately 867,000 acres in Nye County in southern Nevada, about 65 miles northwest of Las Vegas. Since the U.S. Nuclear Testing Moratorium Act went into effect in early October 1992, no nuclear tests have been conducted by the United States.

The core mission at the NTS is to maintain the capability to conduct an underground nuclear test within 2-3 years of any such request by the President. Maintenance of this capability is required by Presidential Directive and is consistent with the Administration's Safeguards accompanying the Comprehensive Test Ban Treaty. To fulfill this mission, the necessary NTS infrastructure, facilities, and technical personnel are supported through exercises and experiments. Subcritical experiments sponsored by the nuclear weapons design laboratories (LANL and LLNL) serve a dual purpose of providing experimental data and exercising nuclear testing personnel skills; these experiments are the primary basis of maintaining nuclear test readiness.

Pantex Plant

The Pantex Plant is located on approximately 10,177 acres about 17 miles northeast of Amarillo, Texas. Pantex is the only facility in the complex for quantity assembly/disassembly of nuclear weapons.

Plutonium pits from dismantled weapons are stored at Pantex. The site has been designated as the permanent location for strategic reserve pit storage and the interim storage location for surplus pits resulting from dismantlement activities and the planned closure of the Rocky Flats Site.

Pantex also fabricates high explosives used in nuclear weapons and performs modifications and surveillance of nuclear weapons scheduled to remain in the enduring stockpile.

Pantex is participating with the other plants and the laboratories in the Enhanced Surveillance Campaign and in the Advanced Design and Production Technologies (ADAPT) Campaign. A five-year agreement with the State of Texas commits DOE to fund the Amarillo National Resource Center for Plutonium. FY 1999 is the last year funding is provided under the current agreement. DOE has received inquiries from the State requesting the extension of the agreement for another five-year period.

Beginning in 1999, the assembly/disassembly and the high explosives fabrication facilities are being appropriately downsized to support the future stockpile. By approximately 2005, these facilities will be about two-thirds their current size. This downsizing will involve modifications and consolidations within the existing footprint.

Sandia National Laboratories (SNL)

SNL is located on the 75,520-acre Kirtland Air Force Base military reservation about 6.5 miles east of downtown Albuquerque, New Mexico. It occupies about 18,000 acres on the Kirtland reservation and has additional facilities in Livermore, California, and in Tonopah, Nevada.

SNL is responsible for the nonnuclear components and systems engineering for all nuclear weapons and is a crucial point of contact with the DoD in the areas of weapon requirements, system design, logistics, surveillance, training, and dismantlement. SNL manufactures certain nonnuclear components including neutron generators and is capable of providing an assured source of radiation hardened electronics. SNL provides unique capabilities in advanced manufacturing technology, microelectronics, and photonics and maintains distinctive competencies in engineered materials and processes, computational and information sciences, engineering sciences, and pulsed-power technology. Distributed Computing and Distance Computing, a component of the ASCI program, will originate at SNL.

Among the major specialized facilities at SNL are a Microelectronics Development Laboratory, a Combustion Research Facility for combustion science and laser spectroscopy, an Advanced Manufacturing Processes Laboratory for rapid prototyping and assessing quality and reliability, an Intelligent Systems and Robotics Center supporting intelligent and agile manufacturing, and Pulsed Power Accelerators for testing and development of defense components.

The Joint Computational Engineering Laboratory (JCEL), to begin in FY 2000 and scheduled for completion in FY 2003, will be a new, state-of-the-art facility at Sandia National Laboratories for research, development, and application of leading-edge, high-end computational and communications technologies.

The Distributed Information Systems Laboratory (DISL), a proposed new construction project in FY 2001, will provide a new research facility to develop and implement distributed information systems. Research at DISL will concentrate on secure networking, high performance distributed and distance computing, and visualization and collaboration technologies for the future nuclear weapons complex.

DP is considering, within the Preliminary Project Design and Engineering project, initiation of Title I design for the Microsystem and Engineering Science Application Facility (MESA) at SNL. MESA would enable the development and production of microsystems to be integrated into weapons systems for improved weapons surety.

Savannah River Site

The Savannah River Site (SRS) occupies approximately 198,000 acres about 12 miles south of Aiken, South Carolina, on the state line with Georgia. Augusta, Georgia is about 16 miles northwest of the site. The primary DP mission at SRS is the recycling of tritium from the weapons stockpile and the loading and surveillance of tritium reservoirs.

SRS tritium facilities will be upgraded and consolidated to support the use of an existing commercial light water reactor. A new tritium extraction facility will be constructed at SRS.

Y-12 Plant

The Y-12 Plant is located on about 800 acres of the almost 35,000-acre Oak Ridge Reservation located about 20 miles west of Knoxville, Tennessee. Y-12 maintains the only capability in the nuclear weapons complex to fabricate quantity uranium and lithium components and parts for nuclear weapons, including secondaries and radiation cases. All current nuclear weapons have components produced at Y-12.

Y-12 has historically stored highly enriched uranium (HEU) and lithium for the nuclear weapons complex and Y-12 is now designated the permanent location for the storage of strategic reserves of these materials. Y-12 also evaluates components and subsystems returned from the stockpile, dismantles nuclear weapons secondaries returned from the stockpile and processes recovered special nuclear materials for storage.

Y-12 is participating with the other plants and the laboratories in the Enhanced Surveillance Campaign to predict component and material lifetimes, a critical element of the Stockpile Life Extension Program, and in the Advanced Design and Production Technologies Campaign.

Headquarters

Funding shown at Headquarters is comprised of two main types of activities: activities where site decisions have yet to be made, and “pass through” funding for M&O sites. A large portion of the “pass through” funding is budgeted for in the Advanced Simulation and Computing component of RTBF and is allocated for hardware acquisition, alliances with academia, and partnerships with U.S. industry. All of these activities will contribute to the development of critical tools and technologies required to meet Stockpile Stewardship goals and objectives.

All Other Sites

Stockpile Stewardship O&M activities are also conducted at several other sites. Activities which support the Tritium Readiness Campaign are conducted at the Pacific Northwest Laboratory and Chicago Operations Office. Recovery of Pu-242 and fabrication of californium sources under the Materials Readiness Campaign take place at the Oak Ridge National Laboratory. Inertial fusion research is conducted at the Naval Research Laboratory through the use of its Krypton-fluoride Nike laser. Nike's capabilities are particularly useful for defining beam smoothness requirements for direct drive laser fusion ignition. In addition, the laboratory has strong capabilities in code development and atomic physics. The University of Rochester's Laboratory for Laser Energetics in Rochester, New York, operates its 60-beam glass laser, Omega, primarily for research on direct drive laser fusion. In addition, the Omega facility is used to field weapons physics experiments by scientists from Lawrence Livermore National Laboratory and Los Alamos National Laboratory. With the shutdown of the Nova laser at LANL, Omega will be used more extensively, pending transition to NIF operations. General Atomics, located in La Jolla, California, is the current contractor for supplying the national laboratories with inertial confinement fusion targets for experimental campaigns.

Capital Operating Expenses Summary

Capital Operating Expenses

(dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
General Plant Projects ^a	47,087	47,500	48,000	500	1.1%
Capital Equipment ^b	146,581	148,000	149,000	1,000	0.7%
Total, Capital Operating Expenses	193,668	195,500	197,000	1,500	0.8%

Major Items of Equipment (*TEC \$2 Million or Greater*)

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior Year Approp- riations	FY 1999	FY 2000	FY 2001	Acceptance Date
Short Pulse Spallation Source	16,700	9,000	7,700	0	0	FY 2000
Radio Conversion	18,000	0	13,000	0	5,000	FY 2002
Total, Major Items of Equipment		9,000	20,700	0	5,000	

^a Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for general plant projects. FY 2000 and FY 2001 funding shown reflects estimates based on actual FY 1999 obligations.

^b Since funds are appropriated for Operations and Maintenance, which includes operating expenses, capital equipment and general plant projects, we no longer budget separately for capital equipment. FY 2000 and FY 2001 funding shown reflects estimates based on actual FY 1999 obligations.

Directed Stockpile Work

Mission Supporting Goals and Objectives

Directed Stockpile Work (DSW) supports Defense Programs' mission to maintain the safety, security, reliability, and performance of the Nation's nuclear stockpile without underground nuclear testing. DSW includes all activities that directly support weapons in the enduring nuclear stockpile, including current maintenance; day-to-day care; and research, development, engineering, and certification activities to support planned life extensions as outlined in the Stockpile Life Extension Program (SLEP). It also includes procurement of materials (exclusive of nuclear materials); fabrication and assembly of nuclear weapons and weapon components; lifetime surety, maintenance and reliability assessments of the enduring stockpile; weapon dismantlement and disposal; and maintenance of field training manuals.

Directed Stockpile Work Goals and FY 1999 - FY 2001 Performance Measures

The goals of DSW include: 1) certify the stockpile and ensure required technologies are available to support the stockpile certification process, 2) provide limited life components for the stockpile, 3) perform quality evaluations, special testing, and surveillance of nuclear weapons systems, 4) support life extension operations and repair, 5) establish baselines for all weapon types, 6) provide required technologies, engineering development and technical oversight necessary to meet the integrated weapons schedule, consistent with DOE surety policies and joint DOE/DoD safety/surety policies, 7) conduct research and development to solve existing stockpile issues and anticipate future stockpile needs, and 8) support the warhead dismantlement/disposal program.

Directed Stockpile Work is budgeted under the following categories: 1) **Stockpile Research and Development** which includes activities that are conducted in the following priority order: maintain system certification, respond to emerging problems or issues in a timely manner, support directive schedules, develop modern physics and engineering baselines, balance future refurbishment schedules against known requirements and available resources, develop refurbishment subsystem technologies, maintain flexibility to respond to new requirements, maintain the development capability to refurbish and design new weapons as required; 2) **Stockpile Maintenance** which includes limited life component exchange, maintenance, and life extension activities on various weapon types in the enduring stockpile to maintain a safe and reliable weapons stockpile; 3) **Stockpile Evaluation** which includes new material laboratory tests, new material flight tests, stockpile laboratory tests, stockpile flight tests, quality evaluations, special testing, and surveillance of weapon systems to assess the safety and reliability of the nuclear weapons stockpile as a basis for the Annual Certification to the President; 4) **Dismantlement/Disposal** which includes all activities including safety analysis associated with weapon retirement, disassembly, component characterization, and disposal and reclamation of materials and components; the engineering, development, testing, certification, procurement, and refurbishment of containers required for interim storage; and the staging and storage of weapons, components, and materials awaiting dismantlement; 5) **Field Engineering, Training and Manuals** which includes costs incurred for technical training of military and contractor personnel participating in the Joint Task Group evaluations of new weapons prior to complete engineering release; and 6) **Production Support** which includes quality and production supervision and control, quality assurance, and production and process engineering.

Historically, the warhead life-cycle has moved through the acquisition phases as indicated below:Phase 1

- Concept Development
- Phase 2 - Program Feasibility Study
- Phase 2A - Design Definition and Cost Study
- Phase 3 - Development Engineering
- Phase 4 - Production Engineering
- Phase 5 - First Production
- Phase 6 - Quantity Production and Stockpile
- Phase 7 - Retirement/Storage

Since all enduring stockpile weapons are currently in Phase 6, an expanded process has been established to extend the life of weapons in the stockpile. The process is actually an expanded subset of the Quantity Production and Stockpile Phase (Phase 6) of the existing process, and has accordingly been called the Phase 6.X process. The Phase 6.X process provides a framework to conduct and manage life extension activities for existing weapons.

The 6.X phases are:

- Phase 6.0 - Quantity Production and Stockpile (Presence in the stockpile before and after the refurbishment project)
- Phase 6.1 - Concept Assessment
- Phase 6.2 - Feasibility Study and Option Downselect
- Phase 6.2A - Design Definition and Cost Study
- Phase 6.3 - Development Engineering
- Phase 6.4 - Production Engineering
- Phase 6.5 - First Production
- Phase 6.6 - Full-Scale Production

Directed Stockpile Work	FY 1999 - FY 2001 Performance Measures
Stockpile R&D	<p><u>B61-7,11</u>: Complete the phase 6.2/6.2A study initiated in FY 2000; start full-scale engineering development (FSED) for the canned secondary assembly (CSA)/Surety stockpile life extension program (SLEP); begin baselining physics and engineering performance.</p> <p><u>W76</u>: Phase 6.3 authorization/initiate limited FSED as a follow-on to the phase 6.2/6.2A study which is to be completed in FY 2000; neutron generator hostile environment certification; type 2F joint test assembly (JTA) first production unit (FPU).</p> <p><u>W80</u>: Phase 6.3 authorization/initiate limited FSED as a follow-on to the phase 6.2/6.2A study which is to be completed in FY 2000; initiate transfer of design responsibility from Los Alamos to Lawrence Livermore; begin baselining physics and engineering performance.</p>

Directed Stockpile Work	FY 1999 - FY 2001 Performance Measures
Stockpile Maintenance	<p><u>B61-3,4,10</u>: deliver Alt 335 and 339 kits for installation in active B61-3, 4, & 10 bombs and QART units.</p> <p><u>B61-7,11</u>: complete retrofits for Alt 349; deliver B61-7 Radar Nose Kits; deliver Alt 336 kits for installation during limited life component exchanges</p> <p><u>W76</u>: initiation of Phase 6.3/6.4; continue neutron generator and ACORN retrofits</p> <p><u>W80</u>: initiate the Phase 6.3/6.4 portion of the life extension program.</p> <p><u>B83</u>: continue Alt 750 which is part of the Quality Improvement Program to improve safety, reliability and use control; continue Alt 752 which incorporates New Heights of Burst.</p> <p><u>W87</u>: initiate Alt 345 to replace the current W87 gas transfer system with a new type bottle; continue Alt 342 to improve the structural integrity and extend the life of the W87</p> <p><u>LLCE</u>: produce 1M and 2M reservoirs and deliver gas generator kits for the B61 program; continue ACORN and neutron generator retrofits for the W76; produce reservoirs for the W62, W78 and W80; deploy new reservoirs on the W87 and continue gas transfer system exchange on the W88.</p>
Stockpile Evaluation	<p>Continue flight tests on samples to assure hardware performs reliably, safely and meets operational flight requirements.</p> <p>Continue laboratory tests on pits, canned subassemblies, electrical components, cables, high explosives and other weapons components.</p> <p>Continue procurement, fabrication, and assembly of components for use in special tests (accelerated core and historical samples) and shelf-life tests.</p>
Dismantlement/Disposal	<p>Dismantle weapons in accordance with Production and Planning Directive 2000-0.</p> <p>As of October 1, 1999, most quantitative information regarding the dismantlement program has been classified Confidential Formerly Restricted Data.</p> <p>Classified details are available upon request.</p>
Field Engineering, Training and Manuals	<p>Conduct classroom and field training in weapons handling for DOE, DoD, and laboratory personnel.</p> <p>Continue maintenance, preparation and distribution of approximately 140 technical manuals for DoD.</p> <p>Provide field engineering support for Alts/Mods and identified repairs.</p>
Production Support	<p>Provide quality and production supervision and control, quality assurance, and production and process engineering.</p>

Funding Schedules

(dollars in thousands)

New Structure:

Directed Stockpile Work

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Stockpile Research and Development . .	204,535	236,063	243,300	7,237	3.1%
Stockpile Maintenance	228,367	240,745	257,994	17,249	7.2%
Stockpile Evaluation	118,842	118,140	151,710	33,570	28.4%
Dismantlement	29,767	29,111	29,260	149	0.5%
Production Support	136,047	131,830	149,939	18,109	13.7%
Field Engineering, Training & Manuals . .	4,000	4,088	4,400	312	7.6%
Total, Directed Stockpile Work	721,558	759,977	836,603	76,626	10.1%

(dollars in thousands)

Old Structure:

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Stockpile Stewardship	204,535	236,063			
Stockpile Management	517,023	523,914			
Total, Directed Stockpile Work	721,558	759,977	836,603	76,626	10.1%

Detailed Program Justification

Directed Stockpile Work

(dollars in thousands)

FY 1999	FY 2000	FY 2001
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Stockpile Research and Development

Assessment & Certification

Perform engineering and physics analysis to certify that weapons conform to the requirements of their Military Characteristics (MCs) and Stockpile-to-Target Sequence (STS). Activities in this category include: annual certification efforts, conduct of subcritical experiments associated with the certification of specific weapon systems, weapon systems tests such as hydrotests and hi-fidelity joint test assemblies (JTAs), and safety/surety assessments. FY 2001 efforts will support W88 pit certification by FY 2005 and initiate transfer of design responsibility for the W80 from Los Alamos to Lawrence Livermore

78,721	90,927	92,510
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Maintenance

Provide design interface with the DOE weapons production plants. Activities in this category include: production liaison interactions between the weapons laboratories and the production plants, military liaison with the Department of Defense (DoD), and Integrated Safety Process (ISP) systematic review and revalidation of weapon assembly and disassembly operations

25,660	29,414	35,880
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Surveillance

Support assessments of the nuclear package and components of each weapon system to uncover design and manufacturing defects in all phases of production, provide early detection of safety and reliability problems caused by aging and STS environments, and demonstrate compatibility between DoD and DOE interfaces. Activities in this category include surveillance oversight for: enduring stockpile weapon systems, pits, canned secondary assemblies (CSAs), high explosives, polymers, detonators, reservoirs, valves, and safety surveillance monitoring of pits and CSAs being stored while awaiting dismantlement

13,407	17,117	28,559
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Directed Stockpile Work

(dollars in thousands)

FY 1999	FY 2000	FY 2001
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Baselineing

Begin to develop a modern certification basis for each weapon system establishing a peer reviewed understanding and model of weapon system performance and safety including critical design margins and uncertainties. Activities in this category include: 3-D models, nuclear performance models, engineering mechanical/thermal response models, and identifying/analyzing/archiving relevant technical data (No new models will be developed, existing models will be used to better characterize systems to develop a “snapshot in time” of our current understanding of systems using existing technology; this will be used to identify needs for future experimentation and new model development). FY 2001 efforts will begin baselining the W80 and the B61-7,11

9,491 10,591 17,363

Refurbishment

Provide long-term support of the stockpile with corrective maintenance and weapon component replacement and refurbishment as defined by the Stockpile Life Extension Program (SLEP). Activities in this category include: perform engineering design studies to fully understand what is required to extend the life of a system and the development of a suite of options to be used by decision-makers, perform qualification of and certification activities to ensure refurbished systems meet all required military characteristics, support the directive schedule including modifications (mods) and alterations (alts). FY 2001 efforts will support limited initiation of phase 6.3 full-scale engineering development (FSED) for the W80 and the W76

31,375 39,149 39,088

Directed Stockpile Work

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
# Supporting Research & Development			
Research and development (R&D) applicable to specific weapon systems as well as general R&D not yet directly tied to a weapon system. Weapon specific R&D supports technologies needed to support a specific weapon refurbishment, maintenance, surveillance, and/or certification program - activities include: joint test assembly (JTA) redevelopment, acorn development, neutron generator development. General supporting R&D supports technologies to be used to support the nuclear weapons stockpile but is not designed for a specific weapon system - activities include: military requirements as issued by the Nuclear Weapons Council (NWC), technology development/materials studies and advanced development systems engineering	45,881	48,865	29,900
Total, Stockpile Research and Development	204,535	236,063	243,300
Stockpile Maintenance			
# Support Production and Planning Directive schedule for limited life component exchange consistent with START I and/or the ability to reactivate to START I	74,097	82,960	87,787
# Support life extension operations and repairs in accordance with Production and Planning Directive schedule for the B61 Alts 335, 336, and 339, and the B83-1 Quality Improvement Program	90,346	91,456	90,951
# Support life extension operations and repairs in accordance with Production and Planning Directive schedule for the W87 Life Extension Program	40,110	36,433	42,001
# Development and Engineering including material purchase support, program management, and quality support, tester/gauge maintenance and calibration, drafting, industrial engineering associated with stockpile refurbishment efforts. FY 2001 efforts will focus on the W80 and W76 life extension programs	23,814	29,896	37,255
Total, Stockpile Maintenance	228,367	240,745	257,994

Directed Stockpile Work

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
Stockpile Evaluation			
# Conduct new material laboratory tests/stockpile laboratory tests to establish confidence in the performance, reliability, and safety of the nuclear weapon inventory	39,059	39,459	52,894
# Conduct new material flight tests/stockpile flight tests to establish confidence in the performance, reliability, and safety of the nuclear weapon inventory during its intended operational environment	50,382	46,968	65,699
# Conduct surveillance testing to include special testing and surveillance of weapons systems to ensure quality evaluation and certification of the reliability of War Reserve weapons and components.	29,401	31,713	33,117
Total, Stockpile Evaluation	118,842	118,140	151,710
Dismantlement			
# Disassembly of retired weapons; characterization and disposition of components from dismantlement; staging and storage of weapons, components or nuclear materials awaiting dismantlement	29,767	29,111	29,260
Production Support			
# Production Support including quality and production supervision and control, quality assurance, and production and process engineering at the Kansas City Plant	44,995	46,224	48,606
# Production Support including quality and production supervision and control, quality assurance, and production and process engineering at the Los Alamos and Sandia National Laboratory	11,986	12,243	20,249
# Production Support including quality and production supervision and control, quality assurance, and production and process engineering at the Savannah River Site	21,233	21,614	23,006
# Production Support including quality and production supervision and control, quality assurance, and production and process engineering at the Y-12 Plant	57,833	51,749	58,078
Total, Production Support	136,047	131,830	149,939

Directed Stockpile Work

FY 1999	FY 2000	FY 2001
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Field Engineering, Training and Manuals

# Technical training of military and contractor personnel participating in the Joint Task Group evaluations of new weapons prior to complete engineering release	4,000	4,088	4,400
Total, Directed Stockpile Work	721,558	759,977	836,603

Explanation of Funding Changes from FY 2000 to FY 2001

FY 2001 vs. FY 2000 (\$000)

Stockpile Research and Development

Assessment & Certification

Increased efforts will support W88 pit certification by FY 2005 and initiate transfer of design responsibility for the W80 from Los Alamos to Lawrence Livermore . . . 1,583

Maintenance

Increased efforts to fabricate surety Alts and trainers for the B61 3,4, and 10 to baseline design hardware for engineering evaluation. Increased efforts to fabricate neutron tube based neutron generators for engineering evaluation in support of the directive schedule 6,466

Surveillance

Increased efforts to fabricate Joint Test Assembly modules for evaluation in support of weapon system and JTA designs for use in multiple weapon systems 11,442

Baselineing

Increased efforts will begin baselineing the W80 and the B61-7,11 6,772

Refurbishment

Decreased funding for the W87 Life Extension Program is offset by increases to support limited initiation of phase 6.3 full-scale engineering development for the W80 and the W76 -61

Supporting Research & Development

Decreased funding for the Warhead Protection Program (WPP) and reduced general supporting R&D funding for hard and deeply buried targets, force structure requirements or tritium science -18,965

Total, Stockpile Research and Development 7,237

Stockpile Maintenance

# FY 2001 funding for LLCE support is largely driven by production costs for the W76 neutron generator. The initial lot will be produced in FY 2000 and production will ramp up in FY 2001. Also supports production of 1M and 2M reservoirs and delivery gas generator kits for the B61 program; continuation of the ACORN retrofit for the W76; production of reservoirs for the W62, W78 and W80; deployment of new reservoirs on the W87 and continuation of gas transfer system exchange on the W88.	4,827
# FY 2001 funding for Stockpile Life Extension Operations and Repairs is driven by production schedules for the W87 Life Extension Program which will continue through FY 2004. Other Stockpile Modernization/Maintenance efforts during the FY 1999-FY 2001 time frame include the B61 Alts 335, 336, 339, 349 and 350, W76 Alt 317, and the B83-1 Quality Improvement Program, and initiation of Phase 6.3/6.4 for the W76 and W80	5,063
# Development and Engineering funding increase is associated with B61-7 and W76 efforts at the Kansas City Plant	7,359
Total, Stockpile Maintenance	17,249

Stockpile Evaluation

# The increase will largely restore the stockpile evaluation workload to the level necessary to meet critical requirements for providing reliability assessments to the DOD. This includes restart of Y-12 activities supporting Joint Test Assemblies and Quality Evaluations. This also raises the quantities of flight and laboratory test units processed at Pantex to support the normal annual surveillance cycle for each weapon. This also supports the required safety basis work at Pantex to enable operations on the B61, W62, W80 and W88.	33,570
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Dismantlement

# There is no significant change between the two years in this category	149
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Production Support

# Increase is at Y-12 and the laboratories and supports directed workload schedules particularly in the area of Stockpile Evaluation	18,109
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Field Engineering, Training and Manuals

# There is no significant change between the two years in this category	312
Total Funding Change, Directed Stockpile Work	76,626

Campaigns

Mission Supporting Goals and Objectives

Campaigns are focused efforts involving the three weapons laboratories (“tri-lab”), the Nevada Test Site, the weapons production plants, and selected external organizations to address critical capabilities needed to achieve key program objectives. Campaigns are technically challenging, multi-function efforts that have definitive milestones, specific work plans, and specific end dates. The approach was initiated several years ago in the planning and execution of several new Defense Programs activities, including the Accelerated Strategic Computing Initiative and the Enhanced Surveillance Program.

Campaign Goals/End States and FY 1999 - FY 2001 Performance Measures

Currently, there are 17 Stewardship Campaigns. Each Campaign is planned and managed through individual Program Plans and executed each year through annual Implementation Plans. Program Plans are available for additional information. There is no funding requested in FY 2001 for implementation of the High Explosives/Assembly Readiness and Nonnuclear Readiness campaigns; we plan to initiate these two campaigns in FY 2002. Below are descriptions of the 17 campaigns, which are described below along with the end states and milestones for each. Defense Programs will be developing baseline end dates for all campaigns in FY 2000.

Stewardship Campaigns

Campaigns	Goals/End States	FY 1999 - 2001 Performance Measures
<i>Primary Certification</i> supports experimental activities to develop and implement the ability to certify, without nuclear testing, rebuilt and aged primaries to within a stated yield level.	Develop and demonstrate the tools required to certify the performance and safety of any rebuilt or aged primary to a specific yield.	Evaluate historical test data for archiving. Assess the effect of engineering and manufacturing technologies on pits. Conduct hydrodynamic experiments and test and validate computational models. Develop an improved dynamic mix model of a boosted nuclear explosion. Obtain equation of state (EOS) and spall data from subcritical experiments. Develop thermochemically based high explosive EOS.

Campaigns	Goals/End States	FY 1999 - 2001 Performance Measures
<p><u>Dynamic Materials Properties</u> supports physics-based, experimentally-validated data and models of all stockpile materials at a level of accuracy commensurate with the requirements of the Primary and Secondary Certification Campaigns.</p>	<p>Develop experimentally validated models of all materials which are essential to assess stockpile performance.</p>	<p>Measurements of fundamental physical properties of deuterium.</p> <p>Interim Pu release equation of state, including refinements from Hugoniot data.</p> <p>Measurement of deuterium fluid phase diagram.</p> <p>Initiate experiments on the Joint Actinides Shock Physics Experimental Research (JASPER) facility at the Nevada Test Site.</p> <p>Initial dynamic measures of strength of materials.</p> <p>Experimental characterization of ejecta.</p> <p>Dynamic measurements of interfacial interactions in weapons materials.</p> <p>Initial tabular high explosive equation of state incorporating new overdriven data.</p> <p>Initial tabular foam description including loading response and decomposition.</p>
<p><u>Advanced Radiography</u> supports research and development technologies for multi-view, time-gated images of imploding surrogate primaries, with sufficient spatial resolution to resolve uncertainties in primary performance. This utilizes advanced multi-time, multi-view, x-ray diagnostic techniques on DARHT, and further development and evaluation of proton radiography techniques.</p>	<p>Provide the technology to obtain 3-D motion pictures of imploding surrogate primaries.</p>	<p>Achieve optimum/minimum spot size on DARHT I target.</p> <p>Complete design of multi-pulse target for DARHT II.</p> <p>Complete evaluation of requirements for advanced radiography facilities.</p> <p>Identify preferred long-term material source.</p>

Campaigns	Goals/End States	FY 1999 - 2001 Performance Measures
<p><u>Secondary Certification and Nuclear-Systems Margins</u> includes theoretical understanding, along with experimental and computational activities which will determine the minimum primary factors necessary to produce a militarily effective weapon.</p>	<p>Determine and document the minimum primary factors necessary to produce a militarily effective weapon.</p>	<p>Begin an evaluation of material-property uncertainties.</p> <p>Identify previously conducted underground tests and AGEX with relevant data, and complete analysis of those tests and experiments.</p> <p>Complete the reevaluation of primary-yield determination (radiochemistry and prompt diagnostics analysis).</p> <p>Complete the evaluation of material-property sensitivities on secondary performance.</p> <p>Identify issues and relevant underground test data associated with features and aging, and also important to marginal performance.</p>
<p><u>Inertial Confinement Fusion Ignition and High Yield</u> addresses high energy density physics issues for the nuclear weapons Stockpile Stewardship Program and develops a laboratory microfusion and high-yield capability for defense and energy applications.</p>	<p>Start of ignition physics implosion experiments (subject to NIF rebaselining), and the enhancement of experimental capabilities for stewardship.</p>	<p>Advanced capabilities to improve ICF target physics necessary to achieve ignition on NIF, including measurement of the deuterium equation of state (EOS), designs for higher efficiency hohlraums, improved capsule designs, and the activation of the Omega cryogenic target handling system.</p> <p>Direct drive illumination uniformity better than 1% was demonstrated on Omega, in support of assessing direct drive for NIF.</p> <p>Complete Z beamlet x-ray backlighter for Stockpile Stewardship experiments on Z.</p> <p>Start national cryogenic target system project.</p> <p>Evaluate NIF hohlraum energetics and laser core diagnostic options.</p> <p>Perform approximately 1600 experiments on Omega and Z in support of ignition and weapons physics campaign goals.</p> <p>Perform high-density cryogenic implosions on Omega and complete a hydrodynamic simulation code for 1D, 2D, and 3D direct drive target performance evaluations.</p> <p>Complete conceptual designs for NIF shock-timing and symmetry diagnostics.</p>

Campaigns	Goals/End States	FY 1999 - 2001 Performance Measures
<u>Certification in Hostile Environments</u> develops the certification tools and microelectronics technologies required to ensure that refurbished weapons meet the Stockpile to Target Sequence (STS) hostile environments requirements.	Demonstrate the capability to support enduring stockpile certification and life extension without underground tests, through radiation hardening, and modeling and validation.	<p>Begin analysis of DSW pit tests on the W76 and W88.</p> <p>Define set of above- and below-ground nuclear test data to be used to benchmark modern code calculation.</p> <p>Improve Saturn x-ray source to produce environments required for effects testing.</p>
<u>Defense Applications and Modeling</u> develops next generation of higher performance software required to certify the performance and safety of the stockpile along with the capabilities to further demonstrate, evaluate, assess, and document the predictive capabilities of the codes and their underlying models.	Provide validated 3-D, high-fidelity physics, full-system simulation codes required for engineering, safety, and performance analyses of the stockpile.	<p>Employ formal software engineering methods for code verification.</p> <p>Validate prototype codes by comparison with both integral experiments and phenomenological tests.</p> <p>Develop advanced materials and physics models and implement advanced models in simulation codes.</p>
<u>Weapon System Engineering Certification</u> establishes science-based certification methods that quantify performance and uncertainties of the stockpile and reduce cost, drive test configurations to most critical event environments, and maximize understanding.	Produce and demonstrate the methodology and metrics to certify a weapon system in the flight and abnormal environments using modeling and simulation tools.	<p>Define modeling and simulation based certification requirements for the flight and abnormal environments.</p> <p>Begin W76 flight models (version 1.0) validation.</p> <p>Complete design for first enhanced RV/RB flight-test article.</p>
<u>Enhanced Surety</u> will provide validated technology for inclusion in the stockpile refurbishment program to assure modern nuclear safety standards are fully met and to provide a new level of use-denial performance.	Demonstrate enhanced surety and initiation options for the entire stockpile.	Develop Full Scale Engineering Development (FSED)-ready technologies for improved surety options for the W80 and W76 systems using current technologies and capabilities
<u>Enhanced Surveillance</u> will provide a validated basis to determine if or when components must be replaced.	<p>Provide documented component lifetime assessments; have predictive tools in place to identify aging defects prior to any impact to safety, reliability, or performance; and develop tools to identify all birth defects in new materials prior to introduction into the stockpile.</p> <p>Meet defined SLEP and certification-driven surveillance requirements.</p>	<p>Vulnerability tests on oldest pits available.</p> <p>Benchmark canned subassembly corrosion models with simulated aging tests.</p> <p>Complete experiments to confirm HE aging mechanisms and benchmark model.</p> <p>Predict performance of highest risk nonnuclear energetic components.</p>

Campaigns	Goals/End States	FY 1999 - 2001 Performance Measures
<u>Advanced Design and Production Technologies (ADAPT)</u> will integrate and systematically deploy capabilities to deliver qualified refurbishment products upon demand. This will be accomplished by developing multiple, fast turnaround engineering options through virtual prototypes and implementing modern product data management and collaboration tools.	Provide the capability to deliver qualified stockpile life extension program refurbishment products upon demand at one-half cost, one-half the current time and with zero stockpile defects.	Provide secure, authenticated, high speed network available at designer's/producer's desktop. Perform pilot project in Model-Based Engineering and Manufacturing (MBE/M). Demonstrate processes for fabricating and packaging high shock environment miniaturized circuits. Continue robotics at FY 2000 level. Continue planning for deployment of integrated design/manufacturing models and process development/agile manufacturing activities.
<u>Pit Manufacturing Readiness</u> includes operating support and the procurement of equipment for the reestablishment of a war reserve pit production capability and a limited production capacity at LANL; initiation of the manufacture of quantity pits for certification and ultimate placement into the nuclear weapons stockpile; and planning and implementing a manufacturing capacity for long-term support of the stockpile.	Develop an automated, expandable, robust manufacturing capability to produce replacement pits for stockpiled warheads, without underground testing, within 19 months of the establishment of a production need.	Continue manufacture of development pits leading toward the manufacture of a certifiable W88 pit.
<u>Secondary Readiness</u> ensures present and long-term manufacturing capabilities (equipment, people, processes) for production of secondaries.	Develop the capability to deliver a first production unit secondary within 36 months of receiving a request.	Validate material requirements and specifications. Evaluate designs for improved manufacturability.
<u>HE/Assembly Readiness</u> ensures present and long-term manufacturing capabilities for high explosive fabrication and weapon assembly. Transforms NWC manufacturing operations to meet stockpile requirements with lower costs and faster responses to changing needs.	Develop the capability for HE/assembly readiness, by providing the technologies, facilities, and personnel for high-explosives component manufacturing, production re-qualification, and weapon assembly/disassembly operations to support a Phase 4 cycle time of 19 months.	This campaign is scheduled to start in FY 2002.

Campaigns	Goals/End States	FY 1999 - 2001 Performance Measures
<u>Nonnuclear Readiness</u> ensures present and long-term manufacturing capabilities for Nonnuclear production.	Bring all identified production vulnerabilities to an acceptable level of risk; develop advanced technologies to yield defect-free products at half the traditional cost and within 19 months after the need is defined.	This campaign is scheduled to start in FY 2002.
<u>Material Readiness</u> supports the consolidation of weapon-grade HEU resources at Y-12. Provides critical inventory information, processes, and technologies to ensure availability of nuclear and nonnuclear special materials to support SLEP rebuilds and component production campaigns. Provides modern storage facilities, monitoring instrumentation and containers for enhanced protection of national security materials.	Develop a fully integrated material management system supporting strategic material needs with either stockpiled material or the capability to produce new material.	Complete survey of national security materials and requirements. Complete gap analysis and identify strategy or program elements for filling gaps.
<u>Tritium Readiness</u> will implement the Secretarial Record of Decision, which selected the Commercial Light Water Reactor option as the primary technology for the production of tritium.	For the primary technology (CLWR): Establish the production systems and operations systems to produce tritium in a commercial reactor so that tritium can be delivered to the stockpile. Suspend preliminary design of the APT plant.	For the primary technology (CLWR): Establish contracts with vendors for the procurement of Tritium Producing Burnable Absorber Rod (TPBAR) components, final assembly and long-term transportation services. Submit documents to initiate the process to amend the Nuclear Regulatory Commission operation license of the Tennessee Valley Authority's Watts Bar and Sequoyah reactors. For the backup technology (APT): Suspend preliminary design.

Funding Schedule

(dollars in thousands)

Campaigns	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Primary Certification	41,996	29,468	41,400	11,932	40.5%
Dynamic Materials Properties	68,206	62,386	64,408	2,022	3.2%
Advanced Radiography	27,122	37,855	43,000	5,145	13.6%
Secondary Certification and Nuclear System Margins	45,520	44,375	52,964	8,589	19.4%
Inertial Confinement Fusion Ignition and High Yield Margins	97,624	99,737	120,800	21,063	21.1%
Certification in Hostile Environments	16,399	13,751	15,400	1,649	12.0%
Defense Applications and Modeling	183,162	227,732	249,100	21,368	9.4%
Weapons Systems Engineering	23,900	14,924	16,300	1,376	9.2%
Enhanced Surety	47,556	38,276	40,600	2,324	6.1%
Enhanced Surveillance	82,877	74,042	89,651	15,609	21.1%
Advanced Design and Production Technologies	109,630	76,393	75,735	-658	-0.9%
Pit Manufacturing Readiness	75,881	69,969	108,038	38,069	54.4%
Secondary Readiness	0	0	15,000	15,000	100.0%
Nonnuclear Readiness	800	0	0	0	0.0%
Materials Readiness	37,900	39,088	40,511	1,423	3.6%
Tritium Readiness	141,000	100,602	77,000	-23,602	-23.5%
Subtotal, Campaigns	999,573	928,598	1,049,907	121,309	13.1%

(dollars in thousands)

Old Structure	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Stockpile Stewardship	632,579	613,379			0.0%
Stockpile Management	366,994	315,219			0.0%
Subtotal, Campaigns	999,573	928,598	1,049,907	121,309	13.1%

Detailed Program Justification

(dollars in thousands)

Campaigns

FY 1999	FY 2000	FY 2001
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Primary Certification

# Develop an improved thermonuclear boost model to support the campaign certification goal	7,700	2,205	7,900
# Assess the impact of new manufacturing technologies on remanufactured components; and develop a pit engineering evaluation of each stockpile weapon system	6,083	5,184	6,800
# Validate improved materials properties models and use these models to improve computational predictions of primary performance	14,811	11,328	10,000
# Conduct integrated hydrodynamic experiments to validate computational models and to demonstrate a certification methodology for aged and remanufactured components . . .	8,062	6,559	11,800
# Analyze historical nuclear test data and develop an accessible archive of information relevant to the certification of primaries in the enduring stockpile	5,340	4,192	4,900
Total, Primary Certification	41,996	29,468	41,400

Dynamic Materials Properties

# Develop physics-based and experimentally validated data and models for the thermodynamic properties of stockpile materials, with emphasis on metals (Pu and others) and boost gas (DT)	15,217	12,908	23,900
# Develop physics-based and experimentally validated data and multi-scale models for the mechanical constitutive properties of stockpile materials, with emphasis on Pu and other metals	29,966	21,018	15,400
# Develop physics-based and experimentally validated data and models for high explosives (HE), organics and foams as they specifically affect performance and safety	11,305	15,380	15,300
# Develop a quantitative understanding of how process variables determine the microstructure and composition of materials which ultimately control their critical performance properties	5,267	5,220	6,340
# University partnerships in dynamic materials research	6,000	7,392	3,000

(dollars in thousands)

Campaigns	FY 1999	FY 2000	FY 2001
# Physical data computational user support	451	468	468
Total, Dynamic Materials Properties	68,206	62,386	64,408
Advanced Radiography			
# Optimize experimental use of DARHT	4,500	8,882	13,600
# Develop and apply comprehensive radiographic simulation and analysis tools, including accurate simulation capability for x-ray and proton transport, efficient and accurate techniques for characterizing radiographic data, and forward and inverse modeling capabilities to analyze radiographs	5,501	4,950	0
# Develop and implement a plan for materials	100	100	500
# Evaluate, design, and develop advanced x-ray radiographic capabilities to provide improved data from hydrodynamic tests to reduce uncertainty in code validation	10,142	14,393	18,500
# Develop proton radiography technology focused on refining advanced hydrotest technical requirements	6,879	9,530	8,700
# Begin development and certification of experimental vessels suitable for use in multi-axis radiography	0	0	1,700
Total, Advanced Radiography	27,122	37,855	43,000
Secondary Certification and Nuclear Systems Margins			
# Develop a validated, predictive computational capability for primary radiation emission, and complete a modern re- evaluation of primary outputs	7,040	11,400	11,300
# Determine the effects of HE-induced case dynamics, experimental determination of distribution and evolution of HE-induced case deformations for full-size systems	5,897	4,117	8,600
# Determine other effects of energy flow, including a validated predictive model capability for energy flow associated with primary explosion through to secondary explosion, and development of advanced energy-flow diagnostics for use on NIF and other AGEX facilities	17,718	16,817	14,600

(dollars in thousands)

Campaigns

	FY 1999	FY 2000	FY 2001
# Determine performance of nominal, aged, and rebuilt secondaries, including development of a validated predictive capability to explain measurements associated with underground tests, implementation of advanced computational techniques, development of advanced hydrodynamic diagnostics, and support of related university activities	14,865	12,041	18,464
Total, Secondary Certification and Nuclear Systems Margins . .	45,520	44,375	52,964

Inertial Confinement Fusion Ignition and High Yield

# Conduct experimental and calculational activities aimed at developing the physics basis for indirect drive and direct drive ignition	40,254	40,532	47,250
# Execute advanced high energy density physics experiments in support of the Stockpile Stewardship Program	20,000	19,900	27,700
# Develop the initial set of NIF core diagnostics and laser characterization diagnostics, and develop advanced target diagnostics	8,300	12,900	16,900
# Define, prototype, design, fabricate, test and deploy the NIF Cryogenic System	0	0	10,000
# Conduct the necessary experimental program in support of assessment of pulsed-power for high yield. Funding is not requested for High Average Power Lasers in FY 2001 . . .	18,950	16,779	7,200
# Headquarters supported activities include university grants in high energy density science, National Laser User Facility activities, national ignition program coordination, and support of critical technical needs	3,320	3,748	5,850
# Complete NEPA documentation, including environmental impact statement, environmental monitoring and permits, and complete assurances, safety analysis and integration (NIF OPC)	6,800	5,878	5,900
Total, Inertial Confinement Fusion Ignition and High Yield . . .	97,624	99,737	120,800

(dollars in thousands)

Campaigns

FY 1999	FY 2000	FY 2001
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Certification in Hostile Environments

# Provide validated, predictive response models for nuclear component survivability in neutron environments by implementing improved material models and implementing them into ASCI mechanical response codes	100	100	400
# Complete up-to-date calculations of weapons outputs, develop some AGEX capabilities to validate these calculations, and pursue accelerated calculations of weapons outputs	975	1,314	1,400
# Develop: silicon-on-insulator (SOI) semiconductor technology and no-upset system capability; comprehensive theory of System Generated Electromagnetic Pulse, radiation induced conductivity, and electron transport; improved radiation sources and diagnostics to support code validation and certification experiments; and validated codes for assessing performance in x-ray environments . . .	15,324	12,337	13,600
Total, Certification in Hostile Environments	16,399	13,751	15,400

Defense Applications and Modeling (ASCI Component)

# Advanced Applications - continue the development of enhanced 3-D computer codes that provide unprecedented levels of fidelity in weapons simulations. These codes will require the performance of the 10 and 30 TeraOps machines planned for 2000 and 2001, respectively. Applications will focus on 3-D prototypical codes capable of simulating the dynamic response of a re-entry vehicle system to normal flight environments and the explosion of the nuclear weapon with three-dimensional engineering features.	104,252	113,120	118,100
# Materials Physics and Modeling will continue to incorporate into ASCI application codes the behavior of materials that are used in the stockpile weapons as those materials are subjected to the conditions created by a nuclear explosion and as they age	68,060	80,820	94,000
# Verification and Validation will begin developing methodologies for assessing the accuracy and fidelity of the ASCI application programs, for example by testing code features against theory or data from experiments	10,850	33,792	37,000

(dollars in thousands)

Campaigns

	FY 1999	FY 2000	FY 2001
Total, Defense Applications and Modeling	183,162	227,732	249,100

Weapons Systems Engineering

# System Level Confirmatory Experiments will conduct system level experiments to demonstrate computational prediction of ground and flight test performance, ground test capability to confirm models, high-fidelity instrumented flight test configuration to confirm models within fewer flight opportunities, data acquisition/fusion and analysis supporting smarter system-level experiments	3,861	174	300
# Model Validation Experiments will provide experimental data to validate the models and codes provided by ASCI . .	20,039	14,518	15,000
# Instrumentation will develop the high fidelity instrumentation necessary (primarily for flight tests) to collect the right data with sufficient fidelity to be able to validate ASCI provided codes and models		232	1,000
Total, Weapons Systems Engineering	23,900	14,924	16,300

Enhanced Surety

# Develop and demonstrate advanced initiation options, to include new concepts in stronglinks and firing systems, which would provide a higher assessed level of nuclear detonation safety	23,846	19,640	21,550
# Develop and demonstrate enhanced use denial options, internal and external to the warhead, which would provide a higher assessed level of performance	23,710	18,636	19,050
Total, Enhanced Surety	47,556	38,276	40,600

Enhanced Surveillance

# Conduct a pit study to determine whether pit lifetimes equal or exceed 60 years (enabling substantial deferral or downsizing of a potential new pit manufacturing facility) and will develop and implement new, non-destructive examination tools for early detection of potential flaws . . .	30,829	23,300	25,797
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(dollars in thousands)

Campaigns

	FY 1999	FY 2000	FY 2001
# Conduct a Canned Sub Assemblies (CSAs) study to determine when these major components as well as cases need to be replaced and will develop and implement new, non-destructive examination tools for early detection of potential changes in behavior	11,846	10,758	17,017
# Conduct a study in High Explosives/Energetics to determine when the full range of conventional and insensitive high explosives must be replaced. New diagnostic tools for early detection of potential changes to safety, reliability and performance will be developed and implemented	11,409	10,095	10,676
# Predict changes in critical non-nuclear material properties for both existing and replacement materials. These materials will be selected based on the highest risk for producing unacceptable degradation in weapon system performance	6,844	5,706	8,909
# Inform SLEP planning and system refurbishment decisions with validated performance predictions for high-risk, non-nuclear components and with identification of micro-systems failure mechanism and model-based certification process	5,977	4,189	5,808
# Provide new system-level diagnostics that enhance the ability to detect, assess and predict problems in the stockpile	15,972	19,994	21,444
Total, Enhanced Surveillance	82,877	74,042	89,651

(dollars in thousands)

Campaigns

FY 1999	FY 2000	FY 2001
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Advanced Design and Production Technologies

# Process Development (PD) focuses on continuous and innovative improvement of individual manufacturing procedures and incorporating advanced systems into plants. PD is essential to maintain and improve production capabilities in the weapons complex while satisfying increased environmental constraints, improved product reliability needs, improved manufacturing efficiency and changes in available materials and processes. FY 2001 activities include: demonstrating processes for fabricating and packaging high shock environment miniaturized circuitry, metal mold for pit processing, and carbon reduction in small electron beam furnace; and development of process technologies for enclosed operations for various materials	36,803	31,633	35,076
# Enterprise Integration interconnects the design and production talents of all the sites of the Nuclear Weapons Complex (NWC) with a single, integrated engineering information infrastructure. Enterprise Integration provides ready access to data and a quality of communication that removes the effect of distance. FY 2001 efforts include: deploying product information system, deploying need to know system, completing systems for W87 LEP data capture, and deploying enterprise models	16,556	16,079	12,829
# Integrated Product and Process Design (IPPD)/Agile Manufacturing develops, validates, and deploys the tools and technologies needed to support and use advanced computer aided and automated design and manufacturing systems. FY 2001 activities include: characterizing existing design/product/processes, developing material models, retrieve data for model validation, developing encapsulation model, and developing automated microplanning	42,846	23,726	26,730
# Deployment Program develops, validates, and deploys specific tools and technologies needed to support and use advanced computer aided and automated design and manufacturing systems in execution of specific SLEP efforts	13,425	4,055	200
# Robotics and Intelligent Machines (RIM)	0	900	900
Total, Advanced Design and Production Technologies	109,630	76,393	75,735

**Weapons Activities/Stewardship O&M/
Campaigns**

FY 2001 Congressional Budget

(dollars in thousands)

Campaigns

FY 1999	FY 2000	FY 2001
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Pit Manufacturing Readiness

# Pit Manufacturing Capability is aimed at capturing the technologies for pit production from the Rocky Flats Plant. This will be accomplished through demonstration of key manufacturing processes and fabrication of development units for the W88, the B61-7, and the W87. These activities have been completed for the W88 and remaining activities will focus on the W87 and the B61. Many of the process operations used at the Rocky Flats Plant are being installed at LANL; equivalent processes are being developed for those operations that cannot be duplicated. LANL is interfacing with LLNL for the W87	10,521	8,079	4,000
# Pit Initiative includes activities at LLNL necessary to support development of key manufacturing processes for the W87 in preparation for manufacture of a development unit and subsequent manufacture of war reserve (WR) W87 pits in support of the stockpile subsequent to W88 manufacturing.	2,005	1,430	2,998
# Nonnuclear Technological Development and Production provides nonnuclear pit components to support the pit manufacturing program. Initial tasks will focus on process development and qualification of those processes needed to fabricate the parts that are currently most needed. In FY 2001, the program will initiate fabrication of nonnuclear parts needed for pit manufacture.	7,396	9,715	14,600
# Quality Assurance establishes and maintains a quality infrastructure for pit manufacturing	1,790	2,557	4,000
# Pit Production supports the fabrication of development pits for the W88, followed by the manufacture of a uniform lot of pits for process qualification, engineering and physics tests, and eventual certification and release of W88 pits for stockpile use	30,840	30,779	58,440

(dollars in thousands)

Campaigns

	FY 1999	FY 2000	FY 2001
# Transition Manufacturing and Safety Equipment focuses on near term upgrades needed to implement the pit manufacturing mission at LANL. This includes maintenance upgrades at TA-55 to assure safety and reliability of facility operation and the replacement of aging research and development equipment through the purchase and installation of equipment required for pit manufacturing. Examples are glovebox diagnostics, foundry upgrades, metal preparation area upgrades, gauges, machining and metallography equipment and vault door and continuous air monitor replacement.	15,753	11,862	20,000
# Other Project Costs provides programmatic planning and support for specific project development and management activities on nuclear construction projects including NEPA coordination efforts, and safety analysis and technical risk assessment. Provides conceptual design for the construction activities necessary to achieve a sustained interim manufacturing capability and capacity	7,576	5,547	4,000
Total, Pit Manufacturing Readiness	75,881	69,969	108,038

(dollars in thousands)

Campaigns

FY 1999	FY 2000	FY 2001
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Secondary Readiness

Conduct studies and develop upgrade/modernization plans, including conceptual and detailed designs, addressing the following infrastructure gaps: an assembly/disassembly facility for the assembly, disassembly, and surveillance of secondaries; a lithium facility for production of lithium hydride and lithium deuteride parts; a depleted uranium facility for the production of depleted uranium parts and other nonnuclear component; an enriched uranium manufacturing facility; a production support facility; an analytical chemistry/research & development laboratory, a non-special nuclear materials storage facility for storage of strategic assets other than highly enriched uranium; administrative/engineering/plant shift superintendent/fire hall/medical facilities; utility systems.

Take measures to address critical skill needs and issues. The specific actions to be undertaken include: activation of a recruiting activity with plans to hire in the May 2001, timeframe; a Technical Fellowship Program will be implemented which is designed to encourage current employees to acquire advanced degrees in technical fields important to our critical skills; summer interns and university co-op programs will be utilized to attract high-potential students for summer work and facilitate a mutual company-employee exposure to lay the groundwork for future hiring of permanent employees

0	0	15,000
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Total, Secondary Readiness

0	0	15,000
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Nonnuclear Readiness

Facilities/Infrastructure

800	0	0
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Total, Nonnuclear Readiness

800	0	0
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Materials Readiness

Materials Supply/Demand Assessment and Planning identifies national security materials on hand and needed in future and gaps and processes needed to transform materials into forms needed and surplus materials and associated disposition paths

19,858	21,705	23,447
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(dollars in thousands)

Campaigns

	FY 1999	FY 2000	FY 2001
# Material Processing and Disposition Capability addresses the production and recovery of additional materials and upgrades/modifications to equipment used to process materials and the restart of process equipment	9,870	8,914	8,500
# Material Storage Optimization identifies enhancements to storage infrastructures and develop strategy for, and install, storage capability/capacity	3,388	4,174	4,304
# Material Packages and Containers identifies storage packages/containers on hand and needed and develop strategy to address need	384	383	360
# Enabling Processes, Technology, and Analytical Tools identifies/develops processes, technology, and analytical tools needed to enable the other MRC major elements including monitoring technologies and robotics	4,400	3,912	3,900
Total, Materials Readiness	37,900	39,088	40,511

Tritium Readiness

# Commercial Light Water Reactor establishes a tritium production system based on using a highly reliable and technically mature technology, CLWR, with tritium producing burnable absorber rods and construction of a tritium extraction facility at the Savannah River Site	56,000	48,814	58,000
# Accelerator Production of Tritium continues engineering development and demonstration activities needed to support the preliminary design definition of accelerator systems, structures, and components. Maintain option with the APT Prime Contractor to complete preliminary design of the APT facility	85,000	51,788	19,000
Total, Tritium Readiness	141,000	100,602	77,000
Subtotal, Campaigns	999,573	928,598	1,049,907

Explanation of Funding Changes from FY 2000 to FY 2001

FY 2000 vs. FY 2001 (\$000)

Campaigns

Primary Certification performs increasingly complex integrated hydrodynamic radiography and subcritical experiments for development of simulation codes and weapon certification	11,932
Dynamic Materials Properties increases to accommodate more extensive determination of plutonium equation of state, phase diagram and response under high-pressure and dynamic conditions.	2,022
Advanced Radiography optimizes the first axis beam on DARHT which became operational in FY 1999. Conducts research and development to begin to define the requirements for advanced radiography capabilities to support certification of refurbished and replaced primaries. This increase has been partially offset by simulation tools being developed in the Defense Applications and Modeling Campaign	5,145
Secondary Certification and Nuclear Systems Margins increases to support design of aboveground experiments to examine HE-induced case dynamics and performance issues required for code validation and to enhance capabilities in hydrodynamic modeling	8,589
Inertial Confinement Fusion Ignition and High Yield increases to support the design and development of the NIF Cryogenic System, the development of the initial set of core target diagnostics and laser characterization diagnostics for NIF, ignition target design and development and experiments to verify conditions necessary for ignition, weapons physics experiments which also support other Stewardship campaigns, and additional grants and national ignition program coordination and technical activities . .	21,063
Certification in Hostile Environments increases to start the development of System Generated Electromagnetic Pulse model validation for the ASCI codes to support the W76 Arming Firing and Fusing (AF&F) certification, to work on 0.5 μ m rad/hard (silicon-on-insulator) technologies for the W76 and future AF&F refurbishments , and to accelerate the calculations of weapons outputs	1,649
Defense Applications and Modeling increases to support Phase I of primary burn code validation within Advanced Applications; Verification and Validation efforts for evaluation of accuracy and fidelity of complex ASCI simulation codes; and Materials Physics and Modeling activities to incorporate the behavior of stockpile materials, both when subjected to nuclear explosion and when aged, into ASCI application codes	21,368

FY 2000 vs. FY 2001 (\$000)

Weapons Systems Engineering increases due to necessary preparations (instrumentation, models/code validation) for the first Beta (full system W76) Flight Environment Test in FY 2002 and first Beta (W76 Full System Thermal) Abnormal Environment Test in FY 2003	1,376
Enhanced Surety increases to accept and test weapon surety subsystems based on LIGA (German acronym for a technique of fabricating small parts with high precision) and micro system technologies, for advanced container concept testing and evaluation, and for component supplier development and qualification	2,324
Enhanced Surveillance increases to conduct a pit study to determine whether pit lifetimes equal or exceed 60 years (enabling substantial deferral or downsizing of a potential new pit manufacturing facility) and develop and implement new, non-destructive examination tools for early detection of potential flaws	15,609
Modeling and simulation tools and information management technologies in the Advanced Design and Production Technologies (ADAPT) campaign	-658
Pit Manufacturing Readiness will focus on continuing the manufacture of development pits leading towards the manufacture of a certifiable W88 pit. Subsequent to FY 2001, activities will move from manufacturing development pits to steady state manufacture of pits for qualification and production pits for placement into the stockpile	38,069
The Secondary Readiness campaign will be initiated in FY 2001 and will conduct studies and develop upgrade/modernization plans to address secondary manufacturing infrastructure gaps and take measures to address critical skills need and issues in a systemic way	15,000
Materials Readiness increase provides funding for the DOE Business Center for Precious Metals	1,423
Tritium Readiness decrease is associated with a continued ramp down of planned engineering development activities and the suspension of preliminary design of the APT facility. Approval to restart and complete the preliminary design will be based on the status of the primary technology through FY 2003. Funding increases for the CLWR technology as the Tritium Producing Burnable Absorber Rod (TPBAR) component procurement increase as the first batch of TPBARs are manufactured for irradiation. CLWR funding also increases for reactor licensing and preparations	-23,602
Subtotal, Campaigns	121,309

Readiness in Technical Base and Facilities

Mission Supporting Goals and Objectives

Readiness in Technical Base and Facilities (RTBF) provides the physical and operational infrastructure at the national laboratories, the Nevada Test Site, production sites and other DP sites required to conduct the scientific, technical, and manufacturing activities of the Stockpile Stewardship program. The RTBF mission is to ensure that the sites comprising the weapons complex are implementing the technologies and methods necessary to make construction, operation, and maintenance of DP facilities safe, secure, reliable and cost effective and that the right facilities and infrastructure are in place to manufacture and certify the 21st century nuclear weapons stockpile. Unlike Campaigns, most of this area does not have a defined end-state since it is an ongoing mission.

RTBF Goals and FY 1999 - FY 2001 Performance Measures

Readiness in Technical Base and Facilities is broken into the following seven subcategories: Operations of Facilities, Program Readiness, Special Projects, Material Recycle and Recovery, Containers, Storage, and Advanced Simulation and Computing. The Department is still reviewing the budget structure changes associated with RTBF and may offer revisions as a technical amendment to the Weapons Activities budget request.

Goals	FY 1999 - FY 2001 Performance Measures
Operations of Facilities is defined as DP's share of the cost to operate and maintain "DP-owned" programmatic facilities in a "warm stand-by" mode. "DP-owned" facilities primarily support campaigns and DSW and are usually over 50% funded by DP budget. "Warm standby" is a state of readiness at which each facility is prepared to execute programmatic tasks identified in the campaigns and DSW. This category includes DP's share of the cost of all structures, equipment, systems, materials, procedures and personnel necessary to provide program sponsors with a facility that is safe, secure, reliable and "ready for operations."	<p>Operate facilities in a safe, secure, reliable, and cost-effective manner.</p> <p>Short Pulse Spallation Source Accelerator enhancement complete by June 2001.</p> <p>Begin ramp up of operations of the Optical Assembly Building of the National Ignition Facility for preparation of clean optical assemblies.</p> <p>Operation of NTS facilities to support laboratory experiments for Stockpile Stewardship program.</p> <p>Rapid Reactivation activities for reservoir assemblies at KCP will be fully operational to support SLEP.</p> <p>Full Operation of the Beryllium Technology Facility at LANL to support SLEP.</p> <p>Expansion of the Neutron Generator Production Facility to support Rapid Reactivation activities at SNL for authorization/readiness reviews.</p> <p>Rapid Reactivation activities will be fully operational for neutron tube target production at LANL to support SLEP.</p> <p>Complete Facilities Capability Assurance Program at Pantex.</p>

<p>Program Readiness includes activities that support more than one facility, campaign, or DSW activity, but are essential to achieving the program's objectives. The activities may vary from site to site due to the inherent differences in site activities and organizational structure. An example of a Program Readiness activity would be inertial fusion target fabrication in support of weapons experiments.</p>	<p>Meet target fabrication requirements of the Stockpile Stewardship program; sitewide EIS update for NV.</p>
<p>Special Projects includes activities which require special control or visibility or do not fit easily into other budget categories.</p>	<p>Payment to Northern New Mexico Educational Foundation, support for Los Alamos School District.</p>
<p>Material Recycle & Recovery includes the recycle and recovery of plutonium, enriched uranium, and tritium from fabrication and assembly operations, limited life components, and dismantlement of weapons and components. Involves the process of recycling and purifying the above materials to meet specifications for safe, secure, and environmentally acceptable storage, including meeting the directive schedule for tritium reservoir refills.</p>	<p>Recover and recycle material from fabrication and assembly operations, limited life components, and dismantlement/disposal of weapons and weapon components.</p> <p>Support DNFSB recommendation 94-1 at LANL.</p>
<p>Containers includes research and development, design, recertification and maintenance, off-site transportation certification of component containers in accordance with Federal regulations, off-site transportation authorization of non-certifiable nuclear materials transportation configuration; test and evaluation, production/procurement, fielding and maintenance, and decontamination and disposal to provide adequate quantities of containers to support the nuclear weapons mission (transportation and storage).</p>	<p>Timely recertification and maintenance of transportation and storage containers.</p>
<p>Storage provides for the cost of storage of weapons material and components. Does not include the cost of temporary storage of materials awaiting processing, staging for dismantlement, or any other interim storage.</p>	<p>Store weapons and weapon components for the foreseeable future.</p>
<p>Advanced Simulation & Computing provides the computational infrastructure necessary to support Stockpile Stewardship programs. This category includes: Integrated Computing Systems (platforms, networks and their operation); the Visual Interactive Environment for Weapon Simulation (VIEWS); and the traditional Accelerated Strategic Computing Initiative & Stockpile Computing strategies including Problem Solving Environment; DisCom2; PathForward; One Program / Three Labs; University Partnerships.</p>	<p>Install 10 TeraOps platform and transition to full production operation, while acquiring 30 TeraOps platform and installing initial configuration.</p>

Funding Schedules

(dollars in thousands)

New Structure:

	FY 1999	FY 2000 ^a	FY 2001	\$ Change	% Change
Readiness in Technical Base and Facilities					
Operations of Facilities	1,286,979	1,320,478	1,313,432	-7,046	-0.5%
Program Readiness	92,063	62,509	75,800	13,291	21.3%
Special Projects	24,711	50,817	48,297	-2,520	-5.0%
Material Recycle & Recovery	17,410	18,649	22,018	3,369	18.1%
Containers	14,127	4,833	7,876	3,043	63.0%
Storage	19,816	15,627	9,075	-6,552	-41.9%
Advanced Simulation and Computing . . .	300,564	397,075	477,075	80,000	20.1%
Total, Readiness in Technical Base and Facilities	1,755,670	1,869,988	1,953,573	83,585	4.5%
PY Work Conducted in FY 1999	28,558	0	0	0	0.0%
Total, Readiness in Technical Base and Facilities	1,784,228	1,869,988	1,953,573	83,585	4.5%

(dollars in thousands)

Old Structure:

	FY 1999	FY 2000	FY 2001
Readiness in Technical Base and Facilities			
Stockpile Stewardship	884,642	975,895	
Stockpile Management	861,028	894,093	
Program Direction	10,000	0	
PY Work conducted in FY 1999	28,558	0	
Total, Readiness in Technical Base and Facilities	1,784,228	1,869,988	0

Detailed Program Justification

^a FY 2000 includes \$41,040,000 in Operations of Facilities associated with the Supplemental Budget Request - \$1,540,000 for Kansas City and \$39,500,000 for Y-12. Details can be found in the Department's FY 2000 Supplemental Request.

Readiness in Technical Base and Facilities

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
Operations of Facilities			
# National Ignition Facility (NIF) Operations at Lawrence Livermore National Laboratory (LLNL) includes continuing the ramp-up of operations activities in the Optics Assembly Building and other support facilities at the NIF, training of NIF operators, and inventory maintenance to support operations activities	25,300	35,586	53,400
# NIF Program Facilities and Infrastructure Buildup Activities at LLNL include performance support and risk mitigation R&D for laser components, optics and laser systems; and conversion of support facilities from Nova capabilities to NIF requirements	55,900	48,900	47,400
# DP's share of the operations of Superblock at LLNL, high explosives, physical data research, and engineering test facilities	45,322	51,021	40,727
# Los Alamos National Lab (LANL) includes operation costs for physics facilities such as: first axis of the Dual-Axis Radiographic Hydro Test facility (DARHT); DP's share of LANSCE operations, high explosives, firing, experimental facilities; operation costs for the Los Alamos Criticality Experimental Facility (LACEF) in support of Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 97-2	88,282	56,631	75,367
# LANL facility operation costs for engineering and ICF facilities; general plant projects, institutional capital equipment, and waste management activities	80,004	77,976	79,084
# LANL operations for Technical Area 55	68,238	63,532	65,434
# LANL operations for Chemistry Metallurgy Research facility, Weapons Engineering Tritium Facility, Technical Area 18, and SIGMA	57,792	60,177	59,637
# Sandia National Laboratories (SNL) includes DP's share of the operations of the Microelectronics Development Lab, Compound Semiconductor Lab, Tonapah Test Range, Area III verification & validation facilities, Area IV and V reactor and accelerator facilities, pulsed power facilities . .	51,100	60,489	61,208

Readiness in Technical Base and Facilities

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
# SNL activities supporting operation of the neutron generator production facility (Building 870)	88,330	89,569	76,527
# SNL institutional capital equipment, general plant projects; and waste management activities	52,794	43,422	45,140
# Nevada Test Site includes DP's share of the operations of the Device Assembly Facility, Big Explosives Experiment Facility, U1a Experimental Complex, Joint Actinide Shock Physics Experimental Research Facility, general plant projects, and other NTS support facilities	56,140	58,803	58,400
# Y-12 Plant includes operation of facilities used for the production of materials contained in secondaries. This includes the following buildings: 9201-1, 9201-5, 9201-5N, 9202, 9204-2, 9204-2E, 9204-4, 9206, 9212, 9215, 9720-5, 9995, 9998. These costs are split between infrastructure costs and site operations costs:			
Infrastructure costs include maintenance, project support, facility startup, facility standby, site planning and project management, capital equipment and general plant projects	84,595	91,406	67,324
Y-12 Site Operations provides for environmental, safety, health programs, and waste management	47,897	47,175	53,818
Y-12 Site Operations also provides for the provision of site utilities	33,814	33,919	35,646
Y-12 Safeguards and Security programs ensure the security of the Y-12 plant, personnel and operations	20,100	23,013	24,870
Y-12 management and administration (M&A) provides for those activities associated with general M&A for FY-12, including information services, human resources, chief financial officer, procurement, legal support, quality assurance, executive direction and management fees	52,632	52,707	51,929
# Savannah River Site includes operation of facilities required to provide tritium and non-tritium loaded reservoirs to meet the requirements of the Nuclear Weapons Stockpile Memorandum, to conduct reservoir surveillance operations, gas transfer system testing, and to manage existing tritium inventories. These activities are carried out in the following buildings: 232, 233, 234 and 238	61,531	60,586	65,980

Readiness in Technical Base and Facilities

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
# Kansas City Plant includes operations of facilities to manufacture and procure nonnuclear components for nuclear weapons, including electrical, electronic, electromechanical, mechanical, plastic, and nonfissionable metal. These costs are split between infrastructure costs and site operations costs:			
Infrastructure costs include maintenance, project support, facility startup, facility standby, site planning and project management, capital equipment and general plant projects	37,327	42,199	39,808
Kansas City Site Operations provides for environmental, safety, health programs, waste management, and the provision of site utilities	20,139	20,110	20,580
Kansas City Safeguards and Security programs ensure the security of the Kansas City plant, personnel and operations	6,380	7,582	8,107
Kansas City management and administration (M&A) provides for those activities associated with general M&A for FY-12, including information services, human resources, chief financial officer, procurement, legal support, quality assurance, executive direction and management fees	68,877	77,030	73,997
# Pantex Plant facility operations include the fabrication of chemical explosives; development work in support of the design laboratory, pit storage; and nuclear weapons assembly, disassembly, testing, quality assurance, repair, retirement, and disposal. The bulk of the Pantex operations are located in Zone 4, Zone 11, and Zone 12. These costs are split between infrastructure costs and site operations costs:			
Infrastructure costs include maintenance, project support, facility startup, facility standby, site planning and project management, capital equipment and general plant projects.	42,705	39,893	29,141
Pantex Site Operations provides for environmental, safety, health programs, waste management, and the provision of site utilities	21,996	24,051	24,048
Pantex Safeguards and Security programs ensure the security of the Pantex plant, personnel and operations . . .	26,441	31,677	34,836

Readiness in Technical Base and Facilities

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
Pantex management and administration (M&A) provides for those activities associated with general M&A for FY-12, including information services, human resources, chief financial officer, procurement, legal support, quality assurance, executive direction and management fees	48,777	51,099	50,546
# All Other DP-Funded Facilities includes funding for non-M&O program facilities, such as the NIKE Laser at the Naval Research Laboratory, and the OMEGA Laser at the Laboratory for Laser Energetics operated by the University of Rochester and the Operations Offices for special projects, one-time or complex wide efforts that do not fit easily into other budget categories or require special control or visibility; examples are use-control studies; Information Technology upgrades supporting SLEP; aviation support for the weapons complex	44,566	71,925	70,478
Total, Operations of Facilities	1,286,979	1,320,478	1,313,432

Program Readiness

# Support for activities that support more than one facility, campaign, or DSW activity, but are essential to achieving the program's objectives. Activities include strategic engagement and awareness exercises; knowledge preservation and archiving; logistical support to the labs' experimental programs; services from other federal agencies; and the Federal Facility Agreement at the Nevada Test Site; and ICF target fabrication support	92,063	62,509	75,800
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Special Projects

# Educational activities supports science and math education programs mainly at the three weapons laboratories	9,000	4,529	6,000
# Los Alamos County Schools enhances teacher salaries and education enrichment activities for the Los Alamos County School District	7,000	8,000	8,000
# New Mexico Educational Enrichment Foundation provides funds to endow the New Mexico Education Enrichment Foundation. Per congressional direction, the Department will provide \$25 million to fully endow the Foundation by FY 2002	3,000	6,000	3,000

Readiness in Technical Base and Facilities

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
# Security investigations for contractors at national laboratories and Nevada Test Site	4,786	6,112	6,112
# Criticality experiments in support of DNFSB Recommendation 97-2	925	950	950
# Institutional infrastructure requirements; for example, NEPA actions, condition assessment surveys, and the R&D Tracking System	0	11,400	11,400
# Engineering and technical support for RTBF activities; for example, independent reviews such as the 30-Day Study and the Chiles Commission; resolution of findings, issues, and concerns from external independent reviews; Federal Laboratory Consortium with NIST, and independent cost estimating requirements	0	13,826	12,835
Total, Special Projects	24,711	50,817	48,297

Material Recycle and Recovery

# Supports the development and implementation of new processes or improvements to existing processes for fabrication and recovery operations for plutonium and uranium, and for material stabilization, conversion, and storage; recycle and recovery of material from fabrication and assembly operations, limited life components, and dismantlement/disposal of weapons and components; supports DNFSB recommendation 94-1 at LANL related to the stabilization of uranium and plutonium residues	17,410	18,649	22,018
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Containers

# Includes research, development, recertification and maintenance and production/procurement of transportation and storage containers	14,127	4,833	7,876
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Storage

# Includes cost of receipt, storage and inventory management of nuclear materials, non-nuclear material, highly enriched uranium, enriched lithium, and weapon components from dismantled weapons. This function is performed at the Y-12 and Pantex Plants	19,816	15,627	9,075
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Readiness in Technical Base and Facilities

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
Advanced Simulation & Computing (ASCI Component)			
# Ongoing computer center operations and evolution of existing simulation capability necessary for maintaining the core computational infrastructure	63,306	40,089	68,600
# Acquisition of computer platforms including final deployment of 10 TeraOps supercomputer in FY 2000 and initial delivery of 30 TeraOps system in FY 2001	94,367	152,393	127,800
# Pathforward activities within industrial partnerships developing key interconnect, storage, and software technologies necessary to accelerate the development of balanced 30 to 100 TeraOps computer systems	17,825	18,611	25,000
# Through Distance and Distributed Computing (DisCom ²) strategy efforts, deploy an enterprise-wide integrated computing architecture capable of supporting application milestone development and execution at a remote site for the first time	25,951	39,328	48,000
# Problem Solving Environment projects include: ASCI Software Development Environment, a common software environment for scalable simulation development across ASCI platforms; Data Transfer and Storage, for improved tera-scale code execution and data exploration; Distributed Systems, will provide secure networking and security infrastructure; and Management and Integration for integrating the improvements for multi-gigabyte parallel data transfer and multi-petabyte archival mass storage	32,425	39,860	40,215
# Visual Interactive Environment for Weapon Simulation (VIEWS) will integrate leading edge visualization and data management and developing technologies that contribute to the “see and understand” capabilities required to view, manipulate, and analyze the massive amounts of data generated by the 3D simulation codes in ever increasing levels of fidelity through Data Visualization Corridors. VIEWS efforts provide the data analysis and visualization infrastructure needed to support the large scale data analysis tasks for “see and understand” capabilities for the simulation program; VIEWS capabilities have been shown to be essential to applications and must constantly increase in order to support the advances in platforms and codes .	40,045	66,640	111,785

Readiness in Technical Base and Facilities

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
# Collaborations with University Partnerships, Alliances, Institutes and Fellowships to leverage other national initiatives, collaborations with multi-agency efforts, universities, and industry; and to attract top researchers in key disciplines to benefit the stewardship program. Funding for One Program/Three labs strategy and Supercomputing Conference also provides investment and leverage to the Simulation program	26,645	40,154	55,675
Total, Advanced Simulation & Computing ^a	300,564	397,075	477,075
PY Work Conducted in FY 1999	28,558		
Total, Readiness in Technical Base and Facilities	1,784,228	1,869,988	1,953,573

^a The Advanced Simulation and Computing totals for the years shown represents Defense Programs contribution to the High Performance Computing & Communications (HPCC) crosscut for DOE.

High Performance Computing and Communications Initiative (HPCC)

Crosscut Estimates

(\$ in Millions)

HPCC Crosscut Category	Advanced Simulation and Computing Subaccounts	FY 1999	FY 2000	FY 2001 Congressional Request
Large Scale Networking	DisCom	26.0	39.3	48.0
High End Computing	PIP, Pathforward	112.2	171.0	152.8
High End Computations and Infrastructure	IEWS and Facility Operations	103.4	106.7	180.4
High Confidence Systems		0.0	0.0	0.0
Human Computer Interface & Information Management		0.0	0.0	0.0
Software Design and Productivity	Problem Solving Environments	32.4	39.9	40.2
Socioeconomic and Workforce Implications of IT and IT Workforce Development	Alliances and Institutes ;1 Program, 3 Labs	26.7	40.1	55.7
Total, HPCC Crosscut		300.7	397.1	477.1

The Advanced Simulation and Computing (ASC) subaccounts do not correlate directly with all HPCC crosscut category definitions. This table represents best judgement application of ASC subaccounts to HPCC crosscut categories. Last year's HPCC crosscut included all funding under Defense Programs' Accelerated Strategic Computing Initiative (ASCI) account. Further analysis indicates that operational aspects of ASCI are not properly identified as part of the HPCC crosscut.

Explanation of Funding Changes from FY 2000 to FY 2001

FY 2001 vs. FY 2000 (\$000)

Readiness in Technical Base and Facilities

Operations of Facilities

#	Increases at Lawrence Livermore National Laboratory for transition from activation and begin ramp up of operations of the Optical Assembly Building of the National Ignition Facility (NIF). This is in preparation for initial installation of clean optical assemblies in the NIF Laser Building. These increases are offset by decreases in operations costs of physics facilities	6,020
#	At Los Alamos National Laboratory, increased operations of first axis of DARHT; increased operating costs at LANSCE; increased maintenance costs due to a one-time reduction in FY 2000 to rebalance funding into the experimental program; increased operations costs for Technical Area 55 offset by minor decreases in other production facilities	21,206
#	Increase at Sandia National Laboratories supports the early microsystems development required for the enduring stockpile, the transition of microsystems technology from research and exploratory development to production-level activity, and the expansion of the infrastructure required for realization of WR-certified microsystems; and waste management activities. These increases are offset by decreases in costs of the production infrastructure	-10,605
#	Minor decreases in the cost of operations of facilities at the Nevada Test Site	-403
#	Oak Ridge Y-12 Facility decreases reflecting the ramp down of Enriched Uranium Operations-Process Based Restart	-14,633
#	Increase at Savannah River Facilities is driven by support for the Stockpile Management Restructuring Initiative to begin the development of operating/maintenance/start-up procedures and a slight increase in overhead allocations consistent with the increase in Directed Stockpile Work	5,394
#	Reduction at Kansas City Plant reflects reduced maintenance and administrative support activities	-4,429
#	Reduction at Pantex Plant reflects reduced project support for new and ongoing construction projects	-8,149
#	All Other DP-Funded Facilities includes funding residing at Headquarters or the Operations Offices for the University of Rochester/Laboratory for Laser Energetics and the Naval Research Laboratory in the ICF program; Headquarters/Operations Office funding supports projects including pollution prevention, beryllium issues, aviation services, Pinellas Pension liabilities, systems integration, campaign analysis and development, and other miscellaneous projects	-1,447

FY 2001 vs. FY 2000 (\$000)

Readiness in Technical Base and Facilities

Total, Operations of Facilities	-7,046
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Program Readiness

# Activities attributable to the requested increase are: increased work at NV associated with the Federal Facility Agreement with the State of NV; making archived testing data more accessible to the public, and a planned NTS site Environmental Impact Study update in FY 2001	13,291
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Special Projects

# Continues support for Los Alamos County School District at the FY 2000 level; direct funding for the New Mexico Education Foundation is decreased by \$3 million; however, LANL will provide an additional \$6 million from overhead funds; other Education activities decreased by \$.9 million; other Special Projects continue at approximately the FY 2000 level	-2,520
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Material Recycle and Recovery

# The increase in funding is at the Y-12 Plant and provides for the operation of restarted processes for Enriched Uranium lithium recycle and recovery to process materials at a rate sufficient to support the Directed Stockpile Work	3,369
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Containers

# The increased funding for containers is associated with the certification and surveillance of secondary and pit staging containers	3,043
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Storage

# The decrease is associated with the transfer of surplus plutonium at the Pantex plant to the Office of Materials Disposition	-6,552
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Advanced Simulation and Computing

# Computer Operations expenses increase as the 10 TeraOps system is developed and delivered while operating expenses for all the 3 TeraOps systems continue	28,511
# Platforms costs decrease from the FY 2000 level as final payments on the Blue Mountain and Blue Pacific systems are realized in FY 2000	-24,593

FY 2001 vs. FY 2000 (\$000)

Readiness in Technical Base and Facilities

#	PathForward activities increase is attributable to the initiation of several software packages efforts that will fill major gaps in available commercial software for ultrascale platforms	6,389
#	Distance and Distributed Computing (DisCom ²) must scale up software development and network bandwidth substantially in order to enable tri-lab use of the 10 TeraOps platform by extremely demanding conditions	8,672
#	Additional funding for the Problem Solving Environment strategy is requested to enable higher levels of quality controls on new and existing computer codes, enhanced levels of accessibility to the platforms, and result in efficiencies in the applications through faster code development and increased scalability to the platforms and networks	1,994
#	Visual Interactive Environment for Weapons Simulation (VIEWS) increases are a result of integrating leading edge visualization and data management and developing technologies that contribute to the “see and understand” capabilities required to view, manipulate, and analyze massive amounts of data generated by the 3D simulation codes in ever increasing levels of fidelity through Data Visualization Corridors. In FY 2001, this integration is planned on a greater scale involving more sophisticated codes on platforms with increased technological capabilities based on demonstrated success. In addition, in FY 2001 VIEWS will do much of the work required to meet the FY 2002 milestone that specifies a 64 Megapixel display driven by a scalable rendering system demonstrated against data from one or more tri-lab weapons applications; that will require acquiring substantial new computing and display equipment as well as development of software to enable the use of scalable parallel technologies	45,145
#	Funding increases for Collaborations with University Partners, Alliances, Institutes and Fellowships are attributable to existing commitments and expansion of the program along with continued development of partnerships with best available expertise in academia to benefit the stewardship program	13,882
Total, Advanced Simulation and Computing		80,000
Total Funding Change, Readiness in Technical Base and Facilities		83,585

Secure Transportation Asset

Mission

The mission of the Secure Transportation Asset (STA) program is to move nuclear weapons, special nuclear material, selected non-nuclear weapons components, limited-life components, and any other Department materials requiring safe, secure transport to and from military locations, between nuclear weapon complex facilities, and to other government locations within the continental United States.

Program Goals

- # Provide safe secure transportation of shipments from shipping point to destination at the time they are required.
- # Ensure the safety of the public from any danger related to the release of radioactive materials in the cargoes being transported.

Program Objectives

The Secure Transportation Asset provides support to all of the DOE Strategic Plan objectives requiring the safe, secure transport of nuclear weapons, special nuclear material, selected non-nuclear weapons components, limited-life components and other Department materials. These DOE Strategic Plan objectives are managed by programs throughout the Department including Defense Programs, Environmental Restoration and Waste Management, Fissile Materials Disposition and Nuclear Energy.

Program Overview

The Secure Transportation Asset is a Departmental support asset providing safe and secure transportation capabilities to the Department. The STA also provides its assets to other government agencies, primarily the Department of Defense, although this work for other agencies represents a relatively small portion of STA's workload.

As the primary historic user of the STA, Defense Programs is currently the sole Department funding source for the program and federal staff. The staff is organized as the Transportation Safeguards Division of the Albuquerque Operations Office. Of the approximately 320 federal TSD staff, about 220 are couriers with the balance providing management and support.

Several recent actions have been taken by the Department to upgrade the capabilities of the Asset. Based on a review and report, the Department made two changes to the courier salary and benefits structure to increase morale, provide a continued ability to attract high quality applicants to the program, and respond to a high rate of disability retirements among the couriers. First, the Department upgraded the grade structure of the couriers in FY 1999, increasing pay rates on average by about 2 pay grades. Second, DOE requested and received approval from the Congress to move the couriers to a 20-year retirement cycle. In FY 2001, Defense Programs will make the third of five annual payments of \$3.5 million to the Office of Personnel Management to fund this retirement cycle conversion.

In FY 2000 the Department also committed itself to increasing the security posture of the Asset. The upgrades, to take place over about five years, will entail bringing on a new courier recruitment class of about 20 individuals each year, upgrading the training of current and new couriers, accelerating the

replacement of the Safe Secure Transport (SST) fleet with the next generation SafeGuards Transporters (SGT), and providing enhanced equipment for the transportation convoys. Additional information on these upgrades is included below in the Detailed Program Justification.

Historically, Defense Programs has been the primary user of the STA within the Department. However, in recent years the number of DP shipments has been decreasing while shipments have been increasing for other DOE offices, primarily Environmental Restoration and Waste Management and Fissile Materials Disposition. In fact it is estimated that during the next five years DP will constitute less than half of STA's workload (see table below). Based on this shift in program priorities, the Department is currently reviewing proposals to implement a cost-sharing formula for STA starting in FY 2002. The final formula will most likely be some form of modified full cost recovery that has each Asset user paying for the full incremental cost of each shipment, but at the same time protects the base resources of the Asset from the vagaries of programmatic execution.

Secure Transportation Asset Workload:

Percentage Use by Program

	FY 1999	FY 2000	FY 2001
Defense Programs	51.0%	53.0%	40.0%
Environmental Restoration and Waste Management (EM)	36.0%	27.8%	51.4%
Fissile Materials Disposition (MD)	12.0%	12.2%	4.2%
Department of Defense (DoD)	1.0%	7.0%	4.4%

Performance Measures

For **FY 2001**, the Secure Transportation Asset will support the following performance measures:

- # Maintain the DOE Secure Transportation Asset for the safe and secure transport of nuclear weapons, special nuclear material and weapon components.
- # Achieve safer transportation of nuclear weapons, weapons components and Special Nuclear Material by increasing thermal protection, and improving braking and handling so as to minimize personnel hazard.
- # Improve security of transportation by enhancing the defensive posture of convoys, improved communications, and more robust control.
- # Successfully complete the second year security upgrades included in the classified "Get Well Project Plan."

Significant Accomplishments and Program Shifts

Starting in FY 2000, Defense Programs will be initiating a series of enhancements to upgrade the security posture of the Secure Transportation Asset. As part of this upgrade plan, the first new courier recruitment class has been brought on board. A second class will be recruited in FY 2001. It is hoped that within five years the total number of couriers will increase between 80 and 100.

Also during FY 2000, six SafeGuards Transporters are being procured. By FY2005 the total trailer fleet will have been converted to SGT's.

The Secure Transportation Asset is also moving to consolidate and upgrade its training facilities by consolidating the training to a single location, increasing the number of instructors, and increasing the frequency of training classes.

Funding Profile

(dollars in thousands)

	FY 1999 Current Appropriation	FY 2000 Original Appropriation	FY2000 Adjustments	FY 2000 Current Appropriation	FY 2001 Request
NEW STRUCTURE					
Program	65,000	60,000	-228 ^a	59,772	79,357
Program Direction	26,391	31,812	-121 ^a	31,691	36,316
Total, Secure Transportation Asset	91,391	91,812	-349	91,463	115,673
OLD STRUCTURE					
Stockpile Management	65,000	0	0	0	NA
Transportation Safeguards Division	0	91,812	-349 ^a	91,463	NA
Program Direction	26,391	0	0	0	NA
Total, Secure Transportation Asset	91,391	91,812	-349	91,463	NA

Explanation of Funding Changes from FY 2000 to FY 2001

The FY 2001 budget request for the Secure Transportation Asset is \$ 24.2 million greater than the FY 2000 appropriation, an increase of 26.5 percent. This increase is driven by the classified "Get Well Project Plan."

^aSecure Transportation Asset's allocated share of Weapons Activities total FY 2000 rescission of \$16,887,000.

Funding by Site

(dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Albuquerque Operations Office	91,391	91,463	115,673	24,210	26.5%
Total, Secure Transportation Asset	91,391	91,463	115,673	24,210	26.5%

Site Description

Albuquerque Operations Office

The Secure Transportation Asset is managed and operated by the Transportation Safeguards Division (TSD) of the Albuquerque Operations Office, Albuquerque, New Mexico. TSD allocates the Asset's personnel and physical resources to meet the Department's transportation requirements; hires, trains, and deploys the nuclear materials couriers; procures, outfits and maintains the transporter fleet of tractors and trailers; and ensures the Asset is equipped and managed to meet the Department's requirements for material security and courier and public safety.

Funding Schedule

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Albuquerque					
Program	65,000	59,772	79,357	19,585	32.8%
Program Direction					
Salaries & Benefits	24,484	27,491	32,325	4,834	17.6%
Travel	1,667	4,151	3,918	-233	-5.6%
Support Services	0	0	0	0	0.0%
Other Related Expenses	240	49	73	24	49.0%
Subtotal, Program Direction	26,391	31,691	36,316	4,625	14.6%
Total, Albuquerque	91,391	91,463	115,673	24,210	26.5%
Federal Staffing	298	323	353	30	9.3%

Detailed Program Justification

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
Program			
▶ Provide for the transportation of Department materials in a safe and secure manner	19,444	24,607	27,147
▶ Provide for the maintenance and repair of the transporter fleet	15,828	19,988	19,277
▶ Provide for necessary communications and communications equipment	11,601	10,961	10,397
▶ Provide for upgrades to equipment and escort vehicles required to upgrade the security posture of the Secure Transportation Asset	0	0	3,575
▶ Provide the replace of the Safe Secure Transport (SST) with the SafeGuards Transporter on an accelerated basis	18,127	4,216	18,961
Total, Program	65,000	59,772	79,357
Program Direction			
Salaries and Benefits			
▶ Provides for the federal salaries and benefits of the Transportation Safeguards Division of the Albuquerque Operations Office.	20,974	23,501	27,006
▶ Provide payments to the Office of Personnel Management to convert the nuclear materials couriers to a 20-year retirement schedule (requires 5 annual payments ending in FY 2003).	3,510	3,500	3,500
▶ Recruit new courier classes in FY 2000 and FY 2001, of about 20 individuals each	0	490	1,819
Total, Salaries and Benefits	24,484	27,491	32,325
Travel			
▶ Provide for travel associated with STA shipments and training	1,667	3,824	3,380

(dollars in thousands)

	FY 1999	FY 2000	FY 2001
► Provides for travel payments associated with the recruitment of the new courier classes, including required permanent change of station (PCS)	0	327	538
Total, Travel	1,667	4,151	3,918
Other Related Expenses/Training			
► Provides required training for the nuclear materials courier force	240	49	73
Total, Program Direction	26,391	31,691	36,316
Total, Secure Transportation Asset	91,391	91,463	115,673

Explanation of Funding Changes from FY 2000 to FY 2001 Request

FY 2000 vs. FY 2001 (\$000)

Program

► Continue to provide safe, secure transport of Department materials	1,265
► Provide for necessary upgrades to equipment and escort vehicles to upgrade the security posture of the Secure Transportation Asset	3,575
► Accelerate the replacement of Safe Secure Transports (SST) with the next generation SafeGuards Transporters (SGT)	14,745
Total, Program	19,585

Program Direction

► Continue to provide safe, secure transport of Department materials	3,085
► Recruit new courier classes to support the upgrade of the security posture of the Secure Transportation Asset	1,540
Total, Program Direction	4,625
Total, Secure Transportation Asset	24,210

Program Direction

Mission Supporting Goals and Objectives

Program Direction provides funds for all Federal personnel-related expenses for Defense Programs (DP) offices at the Department of Energy (DOE) Headquarters and the Albuquerque, Nevada, Oak Ridge, Oakland, and Savannah River Operations Offices, except for those necessary to support the Secure Transportation Asset. At the Albuquerque and Nevada Operations Offices, Defense Programs also provides for technical and administrative Federal support for other DOE program, as the Lead Program Secretarial Office for these offices. Funding is also provided for technical support throughout the Defense Programs complex in the areas of environment, safety, and health; safeguards and security; National Environmental Policy Act compliance; and compliance with Federal and state legislation, response to Defense Nuclear Facilities Safety Board recommendations, Departmental Executive Orders, departmental federal staffing initiatives.

Defense Programs is requesting an increase in program direction funding of \$20.4 million, a 10.0% percent increase over the FY 2000 appropriation. The largest portion of this increase, \$10.5 million, is to cover the DP federal staff's salaries and benefits. This increase covers expected cost of living increases, step increases, promotions, and full year funding for the 30 critical new hires brought on-board at Headquarters as part of the Secretary's Workforce 21 initiative in FY 2000.

Defense Programs will be implementing a number of initiatives in FY 2001 to re-engineer, re-size and re-site, the federal workforce, and is requesting \$2.2 million for these activities. Specifically, Defense Programs will need to fill a number of critical technical positions, particularly at the on-site Area Offices, while at the same time ensuring that Headquarters and the Operations Offices continue to support the Stockpile Stewardship mission in the most efficient and effective means possible. These re-engineering efforts will need to be carried out consistent with, and in conjunction with, the implementation of the National Nuclear Security Administration. Since many of the specific details of implementation of the NNSA have yet to be worked out, Defense Programs recognizes that its re-engineering plans are tentative and the funding may have to be reallocated to higher priority NNSA implementation activities.

Also in FY 2001 the Department of Energy will be instituting the Scientific Retention and Recruiting Initiative. The Department has conducted detailed workforce analyses that have identified current and projected staffing disciplines. During FY 1999, DOE conducted a systematic analysis of critical staffing needs within the context of current and projected R&D program missions. The Department will develop a comprehensive plan that will focus on building and sustaining a talented and diverse workforce of R&D Technical Managers. The plan will include innovative recruitment strategies, retention incentives, comprehensive training and development programs for new and current employees, and succession planning. The FY 2001 program direction request for Defense Programs includes \$3.6 million for the Scientific Retention and Recruitment Initiative. This will enable the recruitment of experienced scientists and related support staff in areas of emerging interest to the Department's science mission. Funds will also be used to motivate and retain highly skilled, top-performing technical managers with, for example, retention allowances and performance awards. Additionally, training in areas crucial for effective job performance will be a key element of the initiative.

A relatively small increase, less than \$2 million, is included to cover DP's share of computer and security

upgrades at the Oakland and Oak Ridge Operations Office. Another approximately \$520,000 increase is requested for the transfer of funding responsibility for 6 positions at the Oakland Operations Office from Science to Defense Programs. These six positions are permanently assigned to the on-site federal office at Lawrence Livermore National Laboratory and provide direct support to the Stockpile Stewardship mission by overseeing operational activities at the LLNL.

Performance Measures

- # Ensure the availability of a workforce with the critical skills necessary to meet long term mission requirements.
- # Provide the necessary program, policy, and operational oversight to ensure that all of Defense Programs' FY 2001 Stockpile Stewardship Program Performance Agreement performance measures are successfully completed.
- # Fully support the Department's National Nuclear Security Administration Implementation Plan.
- # Successfully integrate the Department's Scientific Retention and Recruiting Initiative within DP to ensure the availability of scientific and technical personnel to carry out science missions.
- # Re-Engineer the Defense Programs federal staff to ensure the staff is right-placed and right-sized to most efficiently and effectively carry out the Stockpile Stewardship mission.

Funding Profile

(dollars in thousands)

	FY 1999 Current Appropriation	FY 2000 Original Appropriation	FY 2000 Adjustments	FY 2000 Current Appropriation	FY 2001 Request
NEW STRUCTURE					
Salaries & Benefits	127,397	131,614	-2,028 ^a	129,586	140,621
Scientific Retention and Recruiting Initiative/DP Staff Re-Engineering	0	0	0	0	4,478
Travel	5,051	6,035	-93 ^a	5,942	6,100
Support Services	36,069	30,465	-469 ^a	29,996	31,375
Other Related Expenses	51,653	37,460	-577 ^a	36,883	40,225
Support of NV SO Rad/NAR ^b	886	1,226	-5 ^a	1,221	1,272
Subtotal, Program Direction	221,056	206,800	-3,172	203,628	224,071
Adjustments	0	-2,395 ^c	2,395	0	0
Total, Program Direction	221,056	204,405	-777 ^d	203,628	224,071
OLD STRUCTURE					
Stockpile Stewardship	0	0	0	0	NA
Stockpile Management	9,600 ^e	0	0	0	NA
Program Direction	211,456	206,800	-3,172 ^a	203,628	NA
Subtotal, Program Direction	221,056	206,800	-3,172	203,628	NA
Adjustments	0	-2,395 ^b	2,395	0	NA
Total, Program Direction	221,056	204,405	-777 ^c	203,628	NA

^aReductions reflect application of Program Direction allocations of bottom line Weapons Activities general reduction of \$29,800,000 and rescission of 16,887,000.

^bProvides salary and benefit, travel, training and contractual support funding for 13 staff positions at the Nevada Operations Office providing direct support to the Radiological/Nuclear Accident Response (Rad/NAR) assets. The management responsibility for Rad/NAR was transferred to the Office of Security and Emergency Operations (SO) in FY 2000. Headquarters staff associated with the assets is included in the SO budget request.

^cAdjustment of \$2,395,000 reflects allocated share of Weapons Activities appropriation general reduction of \$29,800,000.

^dProgram Direction adjustment reflects allocated share of \$777,000 bottom line Weapons Activities appropriation rescission of \$16,887,000.

^eIn FY 1999, \$9,600,000 to operate the Amarillo, Kansas City, and Kirtland Area Offices was appropriated within the Weapons Stockpile Management decision unit. In FY 2000 and FY 2001 funding to operate these Area Offices is included in the Weapons Program Direction decision unit.

Crosswalk to New Structure Program Direction

In order to maintain consistency with the funding levels shown in the other portions of the Weapons Activities request, the funding requested in the Program Direction narrative ties to the new structure funding levels, not the actual appropriation levels for FY 1999 and FY 2000. The following table provides a crosswalk from the new structure funding levels (first row) to the actual then appropriations for Weapons Program Direction (last row).

Crosswalk from New Structure Request to Then Year Appropriation

(dollars in thousands)

	FY 1999 Current Appropriation	FY 2000 Original Appropriation	FY 2000 Adjustments	FY 2000 Current Appropriation	FY 2001 Request
New Structure Request	221,056	206,800	-3,172 ^a	203,628	224,071
Los Alamos County Schools and Northern New Mexico Educational Enrichment Foundation ^b	10,000	0	0	0	0
Support of AL Area Offices ^c	-9,600	0	0	0	0
Secure Transportation Asset ^d	26,391	0	0	0	0
HQ Radiological/Nuclear Accident Response ^e	2,153	2,200	-8 ^f	2,192	0
Subtotal, Program Direction	250,000	209,000	-3,180	205,820	224,071
Adjustments	0	-2,395	2,395	0	0
Then Year Appropriation	250,000	206,605 ^g	-785 ^h	205,820	224,071

^aAdjustment of \$3,172,000 reflects allocated shares of \$2,395,000 of bottom line Weapons Activities appropriation general reduction of \$29,800,000 and \$777,000 of Weapons Activities appropriation rescission of \$16,887,000. See also note "h."

^bIn FY 1999 annual payment to the Los Alamos County School District (\$7,000,000) and for the Northern New Mexico Educational Enrichment Foundation (\$3,000,000) was appropriated within Weapons Program Direction. In FY 2000 these payments were appropriated within Weapons Stockpile Stewardship/Education.

^cIn FY 1999, \$9,600,000 to operate the Amarillo, Kansas City, and Kirtland Area Offices was appropriated within the Weapons Stockpile Management decision unit. In FY 2000 these activities were transferred to Weapons Program Direction.

^dIn FY 2000, federal salaries and travel funding for the Secure Transportation Asset were combined by Congress with the associated programmatic funding to allow for enhanced management efficiencies.

^eIn FY 2000, the Department transferred management responsibility for Radiological/Nuclear Accident Response (Rad/NAR) from DP to the Office of Security and Emergency Operations (SO). The request and supporting narrative for funding to support the FY 2001 Rad/NAR headquarters staff is included in the SO portion of DOE's budget request; the request to provide funding support for direct Rad/NAR staff at the Nevada Operations Office is included in this Weapons Activities request.

^fAdjustment of \$8,000,000 reflects allocated share of FY 2000 rescission associated with Radiological/Nuclear Accident Response Activities transferred to the Office of Security and Emergency Operations. See also note "h."

^gProgram Direction adjustment of \$2,395,000 reflects allocated share bottom line Weapons Activities appropriation general reduction of \$29,800,000.

^hTotal Weapons Activities Program Direction share of FY 2000 rescission was \$785,000 (\$772,000 discussed in note "a" and \$8,000,000 discussed in note "f").

Funding Schedule

(dollars in thousands, whole FTEs)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Albuquerque^a					
Salaries & Benefits	64,475	64,185	68,356	4,171	6.5%
Travel	2,120	3,000	3,000	0	0.0%
Support Services	9,149	8,102	9,000	898	11.1%
Other Related Expenses	23,670	14,314	14,750	436	3.0%
Total, Albuquerque	99,414	89,601	95,106	5,505	6.1%
Federal Staffing	798	744	744	0	0.0%
Nevada					
Salaries & Benefits	18,385	18,529	20,800	2,271	12.3%
Travel	506	469	500	31	6.6%
Support Services	6,742	6,186	6,500	314	5.1%
Other Related Expenses	7,618	6,449	7,000	551	8.5%
Support of NV SO Rad/NAR ^b	886	1,221	1,272	51	4.2%
Total, Nevada	34,137	32,854	36,072	3,218	9.8%
Federal Staffing ^c	249	237	237	0	0.0%
Oakland					
Salaries & Benefits	6,379	6,825	8,315	1,490	21.8%
Travel	407	324	350	26	8.0%
Support Services	1,871	1,800	2,000	200	11.1%
Other Related Expenses	1,973	2,361	3,725	1,364	57.8%
Total, Oakland	10,630	11,310	14,390	3,080	27.2%
Federal Staffing	79	83	89	6	7.2%

^aAlbuquerque Operations Office does not include funding or staffing for the Secure Transportation Asset. Funding and staffing information for the Secure Transportation Asset can be found in the STA decision unit.

^bProvides salary and benefit, travel, training and contractual support funding for 13 staff positions at the Nevada Operations Office providing direct support to the Radiological/Nuclear Accident Response (Rad/NAR) assets. The management responsibility for Rad/NAR was transferred to the Office of Security and Emergency Operations (SO) in FY 2000. Headquarters staff associated with the assets is included in the SO budget request.

^cNV Federal Staffing includes 13 staff in each year providing direct support to the Office of Security and Emergency Operations managed Radiological/Nuclear Accident Response assets.

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Oak Ridge					
Salaries & Benefits	5,042	5,150	5,300	150	2.9%
Travel	236	236	300	64	27.1%
Support Services	2,484	1,904	1,900	-4	-0.2%
Other Related Expenses	2,596	1,959	2,800	841	42.9%
Total, Oak Ridge	10,358	9,249	10,300	1,051	11.4%
Federal Staffing	63	59	59	0	0.0%
Savannah River					
Salaries & Benefits	2,723	2,834	2,850	16	0.6%
Travel	217	250	275	25	10.0%
Support Services	107	150	175	25	16.7%
Other Related Expenses	84	100	100	0	0.0%
Total, Savannah River	3,131	3,334	3,400	66	2.0%
Federal Staffing	31	29	29	0	0.0%
Headquarters ^a					
Salaries & Benefits	30,393	32,063	35,000	2,937	9.2%
Scientific Retention and Recruitment Initiative/ DP Staff Re-Engineering	0	0	4,478	4,478	100.0%
Travel	1,565	1,663	1,675	12	0.7%
Support Services	15,716	11,854	11,800	-54	-0.5%
Other Related Expenses	15,712	11,700	11,850	150	1.3%
Total, Headquarters	63,386	57,280	64,803	7,523	13.1%
Federal Staffing	259	276	276	0	0.0%

^aFunding and staffing shown for Headquarters does not reflect FY 1999 or FY 2000 funding for Radiological/Nuclear Accident Response. Funding and staffing information for Radiological/Nuclear Accident Response can be found in the request for the Office of Security and Emergency Operations.

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Total Weapons Activities					
Salaries & Benefits	127,397	129,586	140,621	11,035	8.5%
Scientific Retention and Recruitment Initiative/ DP Staff Re-Engineering	0	0	4,478	4,478	100.0%
Travel	5,051	5,942	6,100	158	2.7%
Support Services	36,069	29,996	31,375	1,379	4.6%
Other Related Expenses	51,653	36,883	40,225	3,342	9.1%
Support of NV SO Rad/NAR ^a	886	1,221	1,272	51	4.2%
Total, Program Direction	221,056	203,628	224,071	20,443	10.0%
Federal Staffing	1,479	1,428	1,434	6	0.4%

Detailed Program Justification

(dollars in thousands)

FY 1999	FY 2000	FY 2001
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Salaries and Benefits

Since FY 1995, total DP staff levels have been reduced by 462 FTEs, more than 25 percent. These reductions, although consistent with the Strategic Alignment Initiative and Congressional direction, have resulted in a federal workforce that now lacks certain critical skills necessary to carry out our oversight responsibilities. As a first step towards re-engineering the DP workforce, funding is requested to stabilize the workforce at current levels

127,397 128,536 136,349

The Secretary recognized DP's skills mix issues in promulgating his Workforce 21 Strategy. Within available funds, Defense Programs is taking limited advantage of these increased staffing ceilings during FY 2000. DP is currently working to bring on during FY 2000 an additional 30 technical staff at Headquarters to fill critical mission needs. It is expected that all of these critical new hires will be on-board by the end of FY 2000 and will require full year funding in FY 2001.

0 1,050 3,750

^aProvides salary and benefit, travel, training and contractual support funding for 13 staff positions at the Nevada Operations Office providing direct support to the Radiological/Nuclear Accident Response (Rad/NAR) assets. The management responsibility for Rad/NAR was transferred to the Office of Security and Emergency Operations (SO) in FY 2000. Headquarters staff associated with the assets is included in the SO budget request.

FY 1999	FY 2000	FY 2001
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The Oakland Operations Office - Office of Safety Operations provides federal environment, safety and health subject matter expertise to the Assistant Manager for the Livermore Site, Oakland Operations Office. This office provides direct support of Defense Programs activities, and as such, DP is proposing to transfer funding responsibility for this office from Field Operations

0	0	522
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Total, Salaries and Benefits	127,397	129,586	140,621
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Scientific Retention and Recruiting Initiative/DP Staff Re-Engineering

The Department of Energy has conducted detailed workforce analyses that have identified current and projected staffing disciplines. During FY 1999, DOE conducted a systematic analysis of critical staffing needs within the context of current and projected R&D program missions. The Department will develop a comprehensive plan that will focus on building and sustaining a talented and diverse workforce of R&D Technical Managers. The plan will include innovative recruitment strategies, retention incentives, comprehensive training and development programs for new and current employees, and succession planning. The FY 2001 program direction request for Defense Programs includes \$3,600,000 for the Scientific Retention and Recruitment Initiative. This will enable the recruitment of experienced scientists and related support staff in areas of emerging interest to the Department's science mission. Funds will also be used to motivate and retain highly skilled, top-performing technical managers with, for example, retention allowances and performance awards. Additionally, training in areas crucial for effective job performance will be a key element of the initiative

0	0	3,600
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In addition to the SRRI activities, Defense Programs requires funding to re-engineer its staff. Currently, DP staff is not optimally aligned, with excess staffing at Operations Offices and minimal staff physically co-located at the national laboratories and production plants. FY 2001 funding is requested to support necessary relocation of DP staff slots to resolve these issues.

0	0	878
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Total, SRRI/DP Staff Re-Engineering	0	0	4,478
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Travel

FY 1999	FY 2000	FY 2001
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Travel includes funding for the transportation of government employees, their per diem allowances while in authorized travel status, and other expenses incidental to travel. Travel also includes transportation of things; an example, the transportation of household goods related to a permanent change of station.

Increased funding will support some additional federal travel to offset directed contractor travel reductions and a modest amount to cover increased costs due to inflation. Total increase from FY 2000 is less than 3 percent. 5,051 5,942 6,100

Support Services

Technical support includes services to determine feasibility of design considerations, development of specifications, system definition, system review and reliability analyses, economic and environmental analyses, test and evaluation, surveys or reviews to improve the effectiveness, efficiency, and economy of technical operations. Consistent with Defense Program's continuing efforts to reduce its level of support services, the additional new funding in FY 2001 is very restrained and is significantly below the FY 1999 level of support 16,069 11,996 12,700

Management Support services include analysis of workload and work flow, directives management studies, automatic data processing, manpower systems analyses, assistance in the preparation of programs plans, training and education, and any other reports or analyses directed toward improving the effectiveness, efficiency, and economy of management and general services. Consistent with Defense Program's continuing efforts to reduce its level of support services, the additional new funding in FY 2001 is very restrained and is significantly below the FY 1999 level of support 20,000 18,000 18,675

Total, Support Services 36,069 29,996 31,375

Other Related Expenses

Contractual support and other related expenses for the Albuquerque and Nevada Operations Offices where Defense Programs acts as the Department's landlord: Provides federal work space and maintenance support at these locations. Also included is an annual \$250,000 payment in lieu of taxes to the County of Los Alamos 30,538 20,013 21,000

	FY 1999	FY 2000	FY 2001
Contractual support and other related expenses for DP federal staff at Operations Offices where DP is not the landlord: The increase in FY 2001 supports DP's share of planned ADP upgrades at the Oakland and Oak Ridge Operations Offices that directly benefit the Lawrence Livermore National Laboratory and Y-12 Plant oversight mission	4,653	4,420	6,625
Contractual support, other related expenses, and the Working Capital Fund at Headquarters: Includes DP's allocated share of ongoing Department activities that provide benefit to Defense Programs. In FY 1999 these activities included the Diversity Partnership Program (\$25,000); the Department's Strategic Plan (\$150,000); the Visitor Assignment Management System (\$50,000); the Quality Assurance Working Group (\$150,000); the Safety Management Implementation Team (\$200,000); the Condition Assessment System (\$150,000); the International Activities Database/Website (\$5,000); Special Emphasis Programs (\$2,000); the Payroll Modeling System (\$20,000); Procurement Commerce (\$80,000); the Foreign Travel Management System (\$50,000); Small and Disadvantaged Businesses (\$111,362), and the Facility Information Management System (\$40,000). In FY 2000, funding responsibility for those activities which are primarily programmatic in effort and provide a primary benefit to DP's M&O contractors, as opposed to DP's federal staff, e.g., the Facility Information Management System, are being transferred to Stockpile Stewardship O&M	10,076	11,700	11,850
Provided unique technical assistance on compliance and improvement issues related to environment, safety, health, safeguards and security to management and operating (M&O) contractors	5,636	0	0
Provide support to northern New Mexico tribal governments to aid them in their ongoing efforts to protect Tribal rights and assist departmental decision-making relative to the Los Alamos National Laboratory	750	750	750
Total, Other Related Expenses	51,653	36,883	40,225

FY 1999	FY 2000	FY 2001
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Support of NV SO Rad/NAR

Provides salary and benefit, travel, training and contractual support funding for 13 staff positions at the Nevada Operations Office providing direct support to the Radiological/Nuclear Accident Response (Rad/NAR) assets. The management responsibility for Rad/NAR was transferred to the Office of Security and Emergency Operations (SO) in FY 2000.

Headquarters staff associated with the assets is included in the SO budget request	886	1,221	1,272
Total, Program Direction	221,056	203,628	224,071

Explanation of Funding Changes from FY 2000 to FY 2001

FY 2000 vs FY 2001 (\$000)

Salaries & Benefits

#	Additional funding is requested to maintain current staffing levels, consistent with recent cost rate increases in FY 1998 and FY 1999	7,813
#	Provide full year funding for the 30 Critical New Hires brought on-board during FY 2000 consistent with Department's Workforce 21 Strategy	2,700
#	DP proposes to begin funding the Office of Safety Operations which provides direct support to DP through the Lawrence Livermore Site Office	522
Total, Salaries and Benefits		11,035

Scientific Retention and Recruitment Initiative/DP Staff Re-Engineering

#	Implement the Department's SRRI in FY 2001	3,600
#	Provide funding to re-engineer the DP staff	878
Total, SRRI/DP Staff Re-Engineering		4,478

Travel

#	Increased funding will support some additional federal travel to offset directed contractor travel reductions and a modest amount to cover increased costs due to inflation. Total increase from FY 2000 is less than 3 percent	158
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FY 2000 vs FY 2001 (\$000)

Support Services

#	DP continues to reduce its effective level of procured support services	1,379
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Other Related Expenses

#	Additional funding is required to maintain the current, severely constrained level of contractual and maintenance support at the DP landlord Albuquerque and Nevada Operations Offices	987
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#	Additional funding is requested to provide DP's share of ADP upgrades at the Oakland and Oak Ridge Operations Offices	2,205
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#	Headquarters support costs increase just over 1 percent while covering additional staff and increasing Working Capital Fund cost allocations	150
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	Total, Other Related Expenses	3,342
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Support of NV SO Rad/NAR

#	Provides salary and benefit, travel, training and contractual support funding for 13 staff positions at the Nevada Operations Office providing direct support to the Radiological/Nuclear Accident Response (Rad/NAR) assets	51
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	Total Funding Change, Program Direction	20,443
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Support Services

(dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Technical Support Services					
Feasibility of Design Considerations	4,000	2,000	2,099	99	5.0%
Economic and Environmental Analysis	2,362	1,815	1,933	118	6.5%
Test and Evaluation Studies	9,707	8,181	8,668	487	6.0%
Total, Technical Support Services	16,069	11,996	12,700	704	5.9%
Management Support Services					
Management Studies	2,054	2,510	1,710	-800	-31.9%
Training and Education	500	1,303	1,400	97	7.4%
ADP Support	10,084	10,335	11,667	1,332	12.9%
Administrative Support Services	7,362	3,852	3,898	46	1.2%
Total, Management Support Services	20,000	18,000	18,675	675	3.8%
Total, Support Services	36,069	29,996	31,375	1,379	4.6%

Other Related Expense

(dollars in thousands)

	FY 1999	FY 2000	FY 2001	\$ Change	% Change
Other Related Expenses/Training	3,705	2,572	3,000	428	16.6%
Contractual Services					
Printing and Reproduction	329	302	305	3	1.0%
Rental Space/Facility Maintenance	8,206	10,383	12,000	1,617	15.6%
Software Procurement/Maintenance Activities/ Capital Acquisitions	3,063	3,731	5,600	1,869	50.1%
Other	25,243	14,057	13,370	-687	-4.9%
Total, Contractual Services	36,841	28,473	31,275	2,802	9.8%
Department Working Capital Fund (WCF)					
Estimate	4,562	4,637	4,648	11	0.2%
Other Services procured through WCF	159	451	552	101	22.4%
Total, Working Capital Fund	4,721	5,088	5,200	112	2.2%
Northern New Mexico Pueblos	750	750	750	0	0.0%
ES&H, S&S Technical Support	5,636	0	0	0	0.0%
Total, Other Related Expenses	51,653	36,883	40,225	3,342	9.1%